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# Patient Telephone Appointment System for High Volume Primary Care Sites

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## Abstract

The purpose of this research is to design a patient telephone appointment system for use in the Naval Medical Center San Diego's high volume Primary Care sites, which will reduce variation and ensure efficient, timely, convenient, and appropriate access to care.

This study follows a Continuous Improvement philosophy of customer satisfaction, quality process improvement, and benchmarking, also known as "idealized process redesign." The study defines requirements for technology, staffing mix, training, logistics, and examines morale and process analysis in determining an "idealized" appointment system. This study may serve as a guide for healthcare organizations interested in designing or enhancing facility specific patient telephone access to care.

The study illustrates that the competitive environment requires a much better understanding of customer needs and requirements (including internal customers), the hospital's capability, and how the hospital plans to change. Thus, the hospital must combine the right technological tools with sound business practices built upon key operational data.

Improved and timely access enhances military readiness. More importantly, it demonstrates that healthcare organizations are committed to our customers' healthcare needs. Finally, effective partnering with the patient leads to a healthier population and supports Military Health System optimization.

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## INTRODUCTION

### Background

#### *Military Health System*

The mission of the Department of Defense (DOD) is to provide the military forces needed to deter war and to protect the security of our country (Department of Defense, 1999). The DOD is a Cabinet-level organization, reporting to it are the three military departments (Army, Navy, and Air Force) and fourteen defense agencies (Department of Defense, 1999). The Military Health System (MHS) supports the Department of Defense and the nation's security by providing health support for the full range of military deployments and sustaining the health of members of the Armed Forces and families to advance national security interests (Department of Defense, 1998).

In response to the challenge of maintaining medical combat readiness while providing the best healthcare for all eligible personnel, the Department of Defense introduced TRICARE (Department of Defense, 1998). TRICARE is the military's managed healthcare system combining healthcare delivery systems of each of the military services and Civilian Health and Medical Programs of the Uniformed Services (CHAMPUS) to better use the

resources available to military medicine. Those eligible for TRICARE include: active duty members and their families, retirees and their families, and survivors of all uniformed services. TRICARE Prime is the Health Maintenance Organization (HMO) option centered around the military treatment facility (MTF) and a network of civilian providers. Prime is a voluntary enrollment option, which offers the same scope of coverage currently available under CHAMPUS with the addition of preventive and primary care services. TRICARE Prime costs less than TRICARE Extra (a preferred provider option and TRICARE Standard (a fee-for-service option)) and gives enrollees priority access to care (10.U.S.C. Section 1097 (c)). TRICARE Extra and Standard do not require enrollment. TRICARE offers numerous advantages over civilian health plans to include: 1) individuals are not excluded because of preexisting conditions, 2) there is no cap on pharmacy or overall health benefits, and 3) the benefit is portable. Enrollment growth is critical to the health plan's success, and is one of the key measures of beneficiary satisfaction and acceptance of the TRICARE Program.

Dr. Susan Bailey, Assistant Secretary of Defense for Health Affairs, believes the Military Healthcare System must "stabilize, simplify, and satisfy" to remain viable. In environments where proper ambulatory care involves sequentially scheduling a group of related events, procedure and resource directed scheduling is essential. Moving patients through the medical system in a timely manner is of utmost importance from both the patients' perspective and the health plan's which must

remain competitive in the market. Patients are customers; hence, healthcare must place more emphasis on that first patient contact (DeJesus, 1999). With timely and flexible scheduling, a healthcare plan may gain a patient for life. Dr. Susan Bailey has stated “We’ve got to get our telephones answered and our appointments filled in a prompt and courteous manner” (Diaz, 1999).

Research indicates that there is no one-size-fits-all solution to scheduling because every facility setup and plan is different (DeJesus, 1999). This means that systems must be flexible, and flexibility means people can use them rather cleverly. Defining an organization’s current and future needs up front is imperative (DeJesus, 1999).

## Naval Medical Center San Diego

Naval medical activities first appeared in San Diego in 1914, when a field hospital was set up in Balboa Park to support an encampment of Marines in North Island. Today, Naval Medical Center San Diego (NMCSD) encompasses 79 acres. The catchment area consists of a beneficiary population of approximately 257,111 (Berry, 1999). Staffing consists of approximately 3000 military, 1200 civilian and 600 contract personnel. On average, the Medical Center sees 3872 outpatients and dispenses

6000 prescriptions daily. The Medical Center serves 44 surface ships, five submarines, two aircraft carriers, five USNS ships, and four Coastal Patrol boats, with a total active duty population of approximately 52,000.

TRICARE consists of 12 Regions, with the NMCSD located in Region 9. Currently TRICARE Region 9, with a beneficiary population of 627,675, is at the midpoint of its five-year managed care support contract. TRICARE Region 9 of Southern California is stable, having benefited from a rich managed care environment and the CHAMPUS Reform Initiative of the 1980s, TRICARE's predecessor in southern California. According to Rear Admiral Diaz, Naval Medical Center Commander and Lead Agent of Region 9, the managed care support contract with Foundation Health Federal Services is mature and operating smoothly (Diaz, 1999). TRICARE Region 9 continues to simplify the program through marketing and communication (Marilyn Brown, Department Head of Marketing, personal communication, August 23, 1999). Nonetheless, it must continue to satisfy customers and make TRICARE the health plan of choice in the year 2000.

In efforts to "Deliver the Promise" to provide lifetime healthcare to the retirees, the Department of Defense (DOD) entered into an agreement with the Health Care Financing Agency (HCFA) for a three-year Medicare demonstration project to run from January 1998 through December 2000. Medicare reimburses DOD for care provided to Medicare-eligible beneficiaries of the Military Health System (MHS) on a capitated basis once the facility has exceeded its current expenditures for the over 65

year old population. Naval Medical Center San Diego is one of six military facilities participating in this demonstration project. As part of the agreement, NMCSD, with the support of Foundation Health Federal Services, operates as a Medicare-At-Risk HMO. Medicare eligible beneficiaries who are dual eligible (eligible for care at NMCSD and eligible for Medicare) are offered TRICARE Senior Prime. The agreement is for a maximum enrollment of 4000 members. According to the Regional Operations Medicare/TRICARE Senior Prime Officer, over 3698 dual eligibles have enrolled to date. The goal of this demonstration is to test a cost-effective alternative for delivering accessible and quality care to dual-eligible beneficiaries without increasing the total federal cost for either agency (Commander D. Wasneechak, personal communication, October 21, 1999). This demonstration is one of several ways that the DOD is exploring to better serve the senior beneficiaries.

The NMCSD’s main mission is readiness and delivery of peacetime healthcare in conjunction with contingency support training. This is especially significant as NMCSD is also the Navy’s most active teaching hospital. Since TRICARE Prime is the only HMO that goes to war, NMCSD must have a plan to provide care to enrolled beneficiaries when the military personnel deploy. To augment the staff and to expand the scope of services to the patient population, NMCSD has taken the lead by introducing many innovative partnerships and resource sharing programs, which allow civilian healthcare providers to treat patients within the Medical Center.

Currently there are over 75 active agreements, and the Center has saved nearly $66 million in the first two years of its TRICARE Support Contract (Diaz, 1999). NMCSD is an integrated health system whose goal is to provide the right care, at the right place, and the right time.

The NMCSD continually seeks to provide cost effective and high quality care to its beneficiaries. On January 24, 1997, the Assistant Secretary of Defense for Health Affairs distributed a memo to the Assistant Secretaries for Navy, Army, and Air Force to prescribe policy for the Specialized Treatment Facility Site (STFS) Program. The policy listed the twenty Diagnostic Related Groups (DRGs) for which MTFs could request STFS designation. Requirements for STFS approval include: clinical excellence, experience and outcomes tracking, cost savings, and complexity of care. On February 16, 1998, NMCSD received approval of the STFS designation for fifteen DRGs. With this designation, NMCSD has the authority to treat all patients within a 200-mile radius for the procedures related to these DRGs. The STFS Program went into effect June 1, 1999.

The Joint Commissioning Agency for Healthcare Organizations (JCAHO) accredits nearly 18,000 healthcare organizations and programs. Accreditation from JCAHO means an organization is committed to meeting state-of-the-art performance expectations. The Naval Medical Center San Diego received Accreditation with Commendation on May 23, 1998 (score of 99)-–the highest accreditation decision awarded to a healthcare organization that has demonstrated exemplary performance overall (JCAHO, 1999).

The Naval Medical Center San Diego is a Continuous Improvement Organization. As a teaching hospital, many of the healthcare workers are trainees. Thus, without clear processes and systems, sufficient cross training, and continuity of staff, there is a greater chance for process variation to occur. Beginning in 1989, the Chief of Naval Operations (CNO) decided that Total Quality Leadership (TQL) was to be the management model for the Navy, and the Navy's Surgeon General adopted it as a medical management model in an attempt to manage care (Dr.Brodeur, personal communication, September 29, 1999). As an academic medical institution, the Naval Medical Center welcomed the philosophy of TQL and saw it as a means of standardizing its processes. Approximately 65 process action teams and four quality management boards were developed within the first year at the Naval Medical Center. Also within that first year the hospital developed its first strategic plan (Dr. Brodeur, personal communication, September 29, 1999).

In the mid 1990s JCAHO shifted to a Continuous Improvement model. In 1996, NMCSD merged Total Quality Leadership and Quality Improvement/Quality Assurance into the Office of Continuous Improvement (OCI). This office is a prototype within Navy Medicine, as an integrated Continuous Improvement model that meets JCAHO requirements while also sustaining its own medical management model.

## Statement of the Problem

While TRICARE was designed to improve beneficiary access to care, beneficiaries have complained about difficulties they encounter obtaining care (Government Accounting Office, 1999). A recent Government Accounting Office (GAO) report noted that the Department of Defense (DOD) had not achieved its goal of scheduling 98% of acute and routine appointments within established timeliness standards. Only 70% of appointments for routine visits, and 80% of appointments for routine and acute care, were scheduled within the relevant standards (GAO, 1999).

The appointment timeliness standards established by DOD are similar to those used in private sector managed care programs. The following standards establish the maximum wait times between the day a Prime enrollee requests an appointment and the actual date of the visit: one day for acute illness, one week for routine visits, four weeks for well care, and four weeks for specialty care (10 U.S.C. 1073).

According to DOD Customer Satisfaction Survey, NMCSD is meeting access standards. Nonetheless, the GAO notes the Customer Satisfaction Survey and the Composite Healthcare System (CHCS) appointment scheduling system are inadequate for measuring timeliness against access standards (GAO, 1999). Though TRICARE policies specify access standards, TRICARE Management Activity (TMA) has not delineated similar standards

for patient telephone access to MTFs. Patient complaints and informal survey data indicate patients, staff, and management are unhappy with what is perceived as poor and inconsistent telephone access.

According to the Naval Medical Center's customer measurement system, a statistically valid and reliable method for measuring patient satisfaction, the hospital continues to experience dissatisfaction with its ability to provide telephone appointment access to customers in the high volume clinics (Dr. Brodeur, personal communication, February 3, 2000). Clinic managers feel this has resulted in increased walk-ins, increased use of the emergency room, and inefficient use of staff resources.

Currently, each clinic at the Naval Medical Center makes its own appointments utilizing the Composite Health Care System (CHCS). CHCS is the Military Health System's (MHS) information system that stores biometrics and demographic information on every patient treated within the healthcare facility. Naval Medical Center San Diego has over 800 appointment types. Per Naval Medical Center procedures, patients should not present for care at clinics without appointments except for emergencies and designated walk-in clinics. All Prime enrollees should access their non-emergency healthcare through their Primary Care Manager (PCM). A consult from a physician or PCM is required before an appointment can be scheduled for a specialty clinic.

To move to a true managed care model, people must be able to access their primary care manager. As enrollment has increased at the Medical Center, this has become a concern. It is estimated that approximately 20,000 calls are made monthly, April through September, and 25,000 calls are made monthly, October through March, to the non-active duty Primary Care Clinics (Dr. K. Berry, personal communication, October 21, 1999). According the Department Head of Healthcare Operations and Planning, the number of calls would increase by approximately 400–500 for every additional 1000 primary care member enrollees. Current enrollment growth is about 500 per month (Commander K. Berry, personal communication, October 21, 1999). Currently, enrollment to Pediatrics is closed.

Patient satisfaction is essential to retain market share and is critical in attracting new customers. Efficient telephone access would also facilitate demand management. Since 1994, the Executive Steering Committee (ESC) has identified telephone access as an important problem to solve in its Strategic Plan. Goal 1 of the current strategic plan is to provide timely access to health services, to ensure that a customer-centered delivery system facilitates easy, convenient, and reliable access to appropriate levels of service (Annual Plan for the Year 2000, 1999).

## Purpose of Research

The purpose of this research is to design an optimal patient telephone appointment system for use in the Naval Medical Center San Diego's high volume Primary Care sites, which will reduce variation and ensure efficient, timely, convenient, and appropriate access to care. To further narrow the scope of this research, the Primary Care clinics for this study are the Primary Care Clinic Group (PCCG), Pediatrics, and Internal Medicine. This study will follow Continuous Improvement philosophies of customer orientation, quality process improvement, and benchmarking. This study will look at technology, morale, staffing mix, training, logistics, and process analysis using idealized design to determine the optimal appointment system for Naval Medical Center San Diego. In idealized design, process is one of the most important products (Ackoff, 1984) There are two types of idealized design: constrained and unconstrained (Ackoff, 1984). This study uses a constrained idealized design.

## Literature Review

### *Healthcare Industry*

Society places a value on health, and money is the most generalized form of expressing those values (Getzen, 1997). For activities that are traded on the market such as medical care and drugs, valuation may be complicated or blurred by risks,

discounting, and wage differentials (Getzen, 1997). However, the process of connecting resources used and program effects to specific dollar amounts is understandable (Getzen, 1997). Economists use those decisions made by families and patients to show that they value the length and quality of life, which can be changed by medical care, rather than the fact of mortality which cannot (Getzen, 1997). Although the world's most advanced and proficient healthcare system provides a great deal of excellence, the lack of public knowledge has allowed much care to be delivered that was less beneficial and some that was inherently dangerous. Parson's description of the sick role – ill persons believe that they are not solely responsible for their condition and must enlist the aid of others--explains why patients often abdicate personal responsibility for their condition and recovery to a healthcare system more than willing to accept the authority to decide what is best for them (Sultz & Young, 1997).

Healthcare has traditionally been an industry in which provider interventions focused on acute care when the patient entered the healthcare system because of a health-related episode. Insurers traditionally focused on claims, payment, and billing. However, in today's environment, the focus is shifting from reactive and retrospective to proactive and prospective.

Decades of retrospective reimbursement of virtually unlimited expenditures discouraged frugality and efficiency on the part of the health care industry. As a result, the impetus for healthcare reform has been rising costs. Overall healthcare

costs have risen from 5.3% of gross domestic product (GDP) in 1960 to over 14% in 1996 (Sultz & Young, 1997). The healthcare industry is facing rapidly changing market conditions as attempts are made to control costs, improve access, and increase quality. The rise of health maintenance organizations (HMOs) has driven many of the changes in healthcare. More than 80% of Americans with employer provided healthcare benefits are enrolled in some sort of managed care (Standard and Poor's, 1998). HMOs offer enrollees medical treatment by affiliated doctors for a set fee, leaving insurers to set policies for physicians' treatments and prices. Though HMOs have cut costs through the elimination of services, HMO coverage is reported to be less expensive than traditional coverage. Nonetheless, HMOs have detractors. Many patients balk at the restrictions that bind them and the bureaucratic hoops they must jump through to receive care. Physicians complain that HMO rules keep them from offering patients the best possible care. Under capitation, providers have the incentive to discharge patients from hospitals as early as possible and to utilize as few diagnostic tests, treatments, ancillary services, and referrals as possible.

In order for health plans to effectively manage this population, they must ensure that good systems are in place to provide for the efficient allocation of limited resources, to include staffing and the smart use of technology. Continuous improvement and strategic management are challenges that must be met. Patient care is complex--variable from patient to patient

and from practitioner to practitioner. Thus, the challenge is to guide the healthcare delivery process. Practice guidelines and clinical pathways are tools that can help consumers and health care providers make more informed choices. They are used to improve the quality of care and can improve the cost-effective use of healthcare resources. Other elements of continuous improvement in a managed care setting include focusing on the processes versus the individual, recognizing internal and external customers, and using statistical process control tools to analyze and improve processes.

Captitation has created a new competition in the marketplace that forces healthcare organizations to look at key issues of patient satisfaction to remain viable. Patients have created an increasing demand for access to healthcare information, and they want control over their decisions regarding their personal health.

One way individuals are taking control of their own health is through health related internet sites. More than 30 million American adults now access the Internet seeking health related information (Koenig, 1999). Some providers use the Internet to improve access to service by making appointments, filling or refilling prescriptions, getting lab results, and communicating with patients (Koenig, 1999). TRICARE Prime enrollees at Munson Army Health Center, Fort Leavenworth are now able to send a message directly to the triage nurse on duty or to their Primary Care physician (Munson Army Health Center, 2000). The Fort Leavenworth Activity has provided care to active duty service

members, retirees, and family members in the greater Leavenworth and Kansas City area for over 160 years. In Okinawa, Japan TRICARE Prime enrollees may request routine appointments from the clinic in which they are enrolled via a web site (Naval Hospital Okinawa, 2000). United States Naval Hospital Okinawa is the largest Naval Hospital overseas, with a beneficiary population of more than 57,000 beneficiaries. It is the largest military hospital in the Western Pacific (Naval Hospital Okinawa, 2000).

Studies continue to suggest that 40–80% of all patients entering the healthcare system do not need a physician's care. Also, studies report patients would give up a personal visit with their primary care physician (PCP) if they could get credible and fast information over the telephone or internet (Barr, Laufenberg, & Sieckman, 1998).

*Customer Satisfaction*

Customer satisfaction is a key measure of a plan's success, and hinges on three primary elements: quality of care, cost of care, and access to care (Koenig, 1999). Research has found that a dissatisfied primary care patient can cost a healthcare provider $238,000 in potential revenue over the patient's lifetime (Gustafson, 1999). Moreover, it has been suggested that 75% of all healthcare litigation stems from patients' "feelings"

about how they were treated (Gustafson, 1999). Hence, a patient's contact with the healthcare organization, including the telephone service representative, can have costly ramifications.

More hospitals and health systems are focusing on the importance of the connection between patient and employee satisfaction. The Healthcare Advisory Board conducted research that involved a study of four not-for-profit hospitals ranging in size from 50 to 800 beds. Employees at the hospitals with high morale tended to take greater pride in their occupations and their institutions. The study noted that the employees felt their efforts were appreciated and therefore, they were more likely to provide excellent patient service (Healthcare Advisory Board, 1998). Factors contributing to employee satisfaction included: the establishment of open communication between employees and administrators, training programs, opportunities to advance or shift responsibility, recognition of work completed, and skill-level appropriateness (Healthcare Advisory Board, 1998). In a worker dependent system, employee satisfaction is crucial to a company's bottom line, or return on investment. Increased morale can result in improved teamwork, less sick days, and increased productivity (Surgeon General of the United States Navy, communication, February 1, 2000).

Patient loyalty is critical to success. Effective partnering with the patient leads to a healthier population and supports MHS optimization efforts (Surgeon General of the United States Navy, communication, February 1, 2000). Poor interactions erode

trust and confidence, and good interactions increase patient satisfaction and their perception of value (Surgeon General of the United States Navy, communication, February 1, 2000). When a patient calls for an appointment, the only thing the telephone representatives should ask is " who is your doctor and when do you want to be seen"(Surgeon General of the United States Navy, communication, February 1, 2000).

*Process Improvement*

TRICARE Management Activity (TMA), which is responsible for operating the MHS and for identifying and implementing best business practices throughout the System, has recommended that the appointment process be standardized among the TRICARE regions. This would include data value names for appointment types and other data values used in the appointment process. TMA has determined that the standardization of these business processes and data values is necessary to better support TRICARE customers. To date, TMA has recommended nine MHS standard appointment types for implementation across the MHS (TRICARE Management Activity, 1999). To streamline the process, TMA recommends that one telephone number at the MTF function as the beneficiaries' point of access for all appointing and referral needs. The Department of Defense, in the *Population Health Improvement Policy & Guide*, further recommends a central access number be provided with a minimum of four options: Health Care Information Line, triage healthcare professional, appointment clerk, and a message center for the primary care manager

(Department of Defense, 1999). The Department of Defense (DOD) further recommends that a comprehensive system of advice lines, healthcare information lines, web-based approaches, books, and educational interventions be used for adequate demand management (Department of Defense, 1999).

Chicago's Holy Cross Hospital achieved dramatic service quality turnaround in the wake of a severe cost cutting effort, boosting satisfaction scores from the 5$^{th}$ to the 99$^{th}$ percentile relative to hospitals in the Press, Ganey database. This was accomplished by streamlining processes and algorithms, and by setting explicit performance standards. The hospital formalized service expectations through a zero-tolerance service standard. Expected service behaviors were spelled out in concrete detail to ensure consistent, service-oriented behavior among staff members. Such concrete behaviors included telephone etiquette: "please, thank you, sir, ma'am" in all conversations, answering calls within three rings, identification of department and self when answering the phone, asking permission before placing a caller on hold etc (Healthcare Advisory Board, 1999).

Bethesda Hospital in Pennsylvania identified a Process Improvement Team (PIT) to enhance the scheduling of outpatient services in efforts to improve satisfaction. The Process Improvement Team integrated "voice of the process with that of the customer" to ensure customer needs were met (Greene & Kumar, 1993). Their approach involved developing a complete understanding of the system, identification of the customers, and an understanding of customer expectations.

In 1993, the Healthcare System Analyst for the Assistant Secretary of Defense conducted a study on improving access to care for outpatient clients. In particular, she focused on a DOD pediatric clinic where as many as 40 customers waited in hallways 30 or 40 minutes prior to clinic opening. This was an attempt to get an appointment due to the inability to get access via telephone (Nelson, 1993). A process action team (PAT) was formed to study the process. The PAT identified all customers and then created a flow chart depicting the steps and decision points on scheduling patients. Through brainstorming, the team generated a list of 32 breakdowns. Initiatives that resulted from the study included development of policies and algorithms, staffing improvements, process redesign, technology improvements that included a telephone system with an automatic call distribution (ACD), and Composite Health Care System (CHCS) refresher training.

*Logistics*

Successful Appointment Center design can result in increased employee satisfaction and productivity. Safety should be the organization’s first priority (Dawson, 1999). Other factors to consider include: lighting (indirect lighting is preferred), noise (acoustic wall paneling, sound absorbing foam or tiles, carpeting, plants for absorbing acoustics), and seating (height adjustable armrests, split backs that hug your back, a moveable seat and an adjustable back)(Dawson, 1999). The telephone service representatives are a critical resource in

the accomplishment of the healthcare organization's mission, and job satisfaction is an essential element in retention. Inattention to their needs can result in high turnover and low morale. Ergonomic equipment is crucial, since the telephone service representative (TSR) must perform repetitive telephone tasks 8–12 hours in a given day.

The Americans with Disabilities Act (ADA) is a federal law that can affect work-center design and must be considered. Experts recommend at least 35 square feet per each person's workspace (Dawson, 1999). There are several options to consider in determining telephone service representative seating arrangements. The most common types of workstations are the cluster, the traditional panel system, and the modular or free-standing workstation (Dawson, 1999). A cluster arrangement may save 10 – 25% of floor-space without creating a maze effect and can facilitate communication between agents on the telephone (Dawson, 1999). This must be looked at as a strategic investment, as human issues are a great factor in the design (Dawson, 1999). Good work-center design recognizes the relationship between people and the physical constraints of the workplace (Dawson, 1999).

*The Telephone System*

Technology will greatly influence the decisions of healthcare delivery. However, challenges for a provider organization are greater than technology, as decision makers want to be certain that they obtain value and can leverage

existing investments through integration (Barr et al, 1998). Nonetheless, the healthcare industry realizes that the challenges of achieving cost-containment and effecting positive outcomes can be met only through the deployment of electronic and automated technologies that process and network relevant data.

The system that serves to manage and control an institution’s telephones is the private branch exchange (PBX) which is often augmented by automatic call distributor (ACD) (Mr. Luis Salmeron, personal communication, March 14, 2000). An ACD has two important functions: processing calls and reporting on what is happening. The real value of the ACD system lies in the data that the machines capture and store (Durr, 1998). This includes calls handled and abandoned, individual trunk statistics, average talk time, average speed of answer, and average wait time. The user can obtain such data in real time or historical reports. The ACD can be the heart and soul of the modern call center--“it is the engine of productivity...the single piece of technology without which the whole crumble(s)”(Dawson, 1999). There are PC-based ACDs, PBXs with ACD functions that can compete with standalone ACD systems, standalone ACDs for centers with less than 30 representatives, and the traditional standalone, which is the most sophisticated (Dawson, 1999).

There are differences among switch vendors that must be considered: number of permitted routes, number of permitted steps in route, how quickly changes can be made in routes, and degree of control offered (Durr, 1998).

Another call processing feature is Call Vectoring--which allows conditional commands. Useful conditions include: time of day, number of agents available, number of calls waiting etc. This allows for the organization to put the call center into auto pilot (Mr. Luis Salmeron, personal communication, March 14, 2000). For example, once the appointment center closes, calls can be automatically routed to a predetermined site (i.e. quarterdeck, clinic, TRICARE). When there are less than a predetermined number of agents signed in, calls can be automatically routed to another predetermined site.

Skills based routing (SBR), or expert agent, is an advanced system for distributing calls that come into an ACD. The SBR identifies the capabilities by which the agents are grouped. A resume is built for each agent based upon identified characteristics, which is loaded into the system (Ault & Nussbaum, 1998). Based upon the requirements of the caller, the call is routed to the best qualified agent (Ault & Nussbaum, 1998).

Callers want information quickly, without waiting in queues. Voice processing allows for more calls to be handled through the system without increasing the number of telephone service representatives. The simplest technology is the audiotext, which plays a recorded message. This can free

representatives from answering simple and repetitive questions. An announcer answers incoming calls and plays recorded messages. This system can also work with an ACD to play messages to callers in queue. An announcement can be used to play health prevention information and promotional information.

The automated attendant answers the call, plays a message with a menu of options, then routes the caller to the menu selected. This will allow the callers to direct themselves to the appropriate queue. In conjunction with call vectoring, automated attendant can be used to prevent callers from waiting too long by creating routing tables; thus giving callers a choice after a certain period of waiting in queue.

Screen based voicemail--unified messaging--lets the telephone service representatives (TSRs) call up messages of many kinds on the computer screen including voicemail, email, and fax messages (Dawson, 1999). This requires a computer/telephony interface (CTI) that puts voice mail on the desktop PC. This allows the representative to view messages that come in even when he/she is on the telephone (Mr. Luis Salmeron, personal communication, March 14, 2000).

The integrated voice response (IVR) is an automated system for collecting information from callers. It is a computer system that lets the callers enter information in response to questions through a telephone keypad or voice (Dawson, 1999). The caller can get information from voicemail, fax, Internet, or intranet. This allows the customer to input and review data at anytime. The IVR can be used as a front-end for an ACD by asking

questions, which would assist with call routing (Dawson, 1999). Typically, a “conversant” feature is used to automate the call handling process. The IVR is designed to assist, not to replace humans. Some calls will always require assistance that only a human can provide. The healthcare organization that knows its customers will be able to determine what types of inquiries the IVR system will handle. The IVR is most useful when paired with CTI (Ault & Nussbaum, 1998).

The web can be a useful adjunct to the organization. The internet ACD or e-mail ACD takes email as it comes in, sorts it in some form (sender, subject etc), determines whether it can be answered with an automated response, and if not sends it along to someone who can handle it. These systems can track and audit the response to those emails. The healthcare organization can set the parameters e.g., all emails will be handled within 48 hours.

Another attraction with the Internet is the live chat. For example, a customer can initiate a text chat window from the organization’s web page, having a semi real-time conversation with a representative at the call center (Dawson, 1999). Organizations are moving from traditional environments to the multimedia that can process calls regardless of origin (web, phone, fax) and regardless of form (voice, text, image)(Dawson, 1999). Human interaction can be reserved for where agents add most value.

For efficient scheduling of telephone service representatives, many organizations utilize workforce management (WFM) software packages (Durr, 1998). These packages forecast volume based upon historical data and calculate staff for a desired service level. The system collects data from an ACD by interfacing with a printer port or directly accessing the ACD performance database (Durr, 1998).

Managing the risks involved in providing quality care within a tightly budgeted environment is key across the healthcare industry. Communication solutions can help increase productivity, improve patient care, and positively affect the bottom line; all at the same time (Lucent Technologies, 2000).

Lucent Technologies, a spin-off of AT&T, has become one of the world's most powerful communication companies (Dawson, 1999). The DEFINITY® Enterprise Communications Server (ECS), which is the heart of an evolving multimedia network, utilizes technologies such as Asynchronous Transfer Mode (ATM), Voice over Internet Protocol (VoIP), and Internet Telephony (Lucent Technologies, 2000). The DEFINITY systems can integrate voice, data, and messaging to meet evolving technological needs. DEFINITY systems allow the creation of a virtual enterprise. Locations can be linked via Internet Protocol (IP), ATM, T1/E1 lines, or Integrated Services Digital Network (ISDN)(Lucent Technologies, 2000). The DEFINITY® ECS allows an enterprise to move to a "converged" network without any compromise in

applications or reliability (Lucent Technologies, 2000). A forecasting package allows one to use trended data and “what if” growth scenarios to forecast number of agents and the economic breakeven of staffing and abandoned calls.

Lucent Technologies’ CentreVu Call Management System (CMS) provides information and management tools to help monitor and analyze the performance of the call center. CentreVu CMS provides over real-time and historical management reports designed to help the organization achieve customer service objectives (Lucent Technologies, 2000). Historical data storage capabilities include: detailed intra-hour data, daily reports, and weekly and monthly data (Lucent Technologies, 2000).

Lucent Technologies CentreVu Virtual Routing is a breakthrough solution offered by Lucent Technologies that evens average speed of answer (ASA) across multiple sites (Lucent Technologies, 2000). For a single DEFINITY® ECS, calls are routed to the best local skill group. Service level and ASA is improved without any increased staffing. CentreVu Virtual Routing proactively evaluates call and queue status at multiple sites, and thus shortens customer wait. Management can monitor multiple sites from the Desktop.

Healthcare is an extremely personal interaction. When talking about healthcare, the customers are not going to accept anything that is second-rate, nor should they. Scale-ability, the ability of a technology system to grow as user demand grows, and cost are among the biggest concerns cited by healthcare organizations that have not reengineered their telecom systems

(Stammer, 2000). Mayo Clinic has expressed concern that over-reliance on pure technological solutions will harm rather than help patient care (Stammer, 2000). “Mayo is struggling with the concept of call centers and calling trees because we want our patients calling in to talk to a live human as quickly as possible so they do not get caught in voicemail junk” (Stammer, 2000). Mayo is using a first-generation call-center for its primary appointment desk; however, it currently is investigating the health system’s policies to roll-out additional call centers, voice response systems etc. (Stammer, 2000).

With the promise of improved patient care and efficiency, and increasing pressure from consumers, healthcare organizations may feel compelled to update their telecom systems. Over the next three to five years, technology will continue to drive changes in healthcare.

A discussion of technology is not complete without addressing costs. Research indicates that fully burdened labor (salary and benefits) can easily cost a firm $50,000 annually for one moderately skilled and moderately paid agent (Durr, 1998). The next biggest expense is the cost of the transmission. In a typical five-year call center labor accounts for 65%, transmission 25%, and technology 10%(Durr, 1998).

Costs for ACD systems are frequently discussed in terms of price per agent seat (Durr, 1998). Powerful ACD systems can be purchased for about $3,500 per seat (Durr, 1998). IVR systems are discussed in prices per port, $1,500 per port (Durr, 1998). The cost of WFM software can cost $50,000-$80,000 for each site (Durr, 1998).

*Call Centers*

In the managed care environment one of the most important success factors is volume, or covered lives. Rising healthcare costs and the trend toward capitation as the method of reimbursement has driven interest in call centers. In attempts to provide appropriate care at lower costs, a call center has been referred to as the front-end intervention in the overall demand management strategy (Burke & Honeycutt, 1998). It is reported that nurse triage programs can decrease office visits by 15% without additional staff (Burke & Honeycutt, 1998). Effective nurse triage requires nurses to work from established and proven protocols to help patients arrive at sound decisions in order to receive the right care at the right place and at the right time. Increased patient load with no additional staff equates to lower fixed costs. Demand management is an avenue to that end.

Weed Army Community Hospital (WACH) in Fort Irwin, California implemented a new telephone triage system for its outpatient clinics that increased patient access, customer satisfaction, and improved workload allocation (Weed Army

Community Hospital, 2000). Working together, physicians and administrators developed a new appointment system that allows patients to call in and leave an electronic consult for their primary care manager (PCM), who returns the call and triages them to the appropriate level. Together the physician and the patient decide the appropriate level of care. Consistently, 50-60 percent of the patients who called were safely triaged to self-care, creating significant gains in the appointment access (Weed Army Community Hospital, 2000).

At Weed Army Community Hospital, telephone triage is no longer a “choke point” on the appointment line. Workload is spread among several physicians, rather than having one or two triage nurses tying up the appointment line (Weed Army Community Hospital, 2000). Appointment duration was reduced as physicians can order ancillary tests before seeing the patients. Also, when the patient arrives, complaint and history have already been recorded on the consult; thereby, maximizing physician time. Physicians also have the flexibility to group appointments or to double book based upon the needs of the patient.

A call center is the centerpiece for a strong demand management program where mergers and acquisitions mean larger numbers of covered lives in integrated systems of care. Kaiser Permanente, the nation’s largest not-for-profit MCO, has invested millions of dollars in the Northern California call centers, including the acquisition of interactive voice response technology. Kaiser plans to use the same call center approach nationwide (Christopherson, 1998).

A senior executive at Children's Hospital of Denver, which uses a call center to provide after-hours advice to patients of 300 pediatricians in Colorado, cautions that call centers are not for everyone (Chin, 1998). Automation is quite expensive in terms of upfront and ongoing costs. The medical director reports "it doesn't make sense unless the number of physicians served is more than 40." (Chin, 1998).

A senior researcher at United Healthcare, who studied Optum's 24-hour telephone access, noted that the adoption of triage and decision support programs deliver much more value than simply diverting patients from care. Rather, it is getting the right care at the right time for the individual (Otis, 1998).

Research by the Healthcare Advisory Board indicates that improving telephone service doesn't always equate to patient satisfaction. The five Family Practice Clinics studied experienced greater than 100 calls daily. Each clinic was owned by a not-for-profit hospital ranging in size from a 200-bed to a 1000-bed facility. Clinics in this study had reported increased call abandonment rates as high as 35%; others reported that patients abandoned calls if waiting in queue greater than two minutes. All sources implemented new telephone systems to include the introduction of ACD system and automated voicemail. Clinics that increased their staff in addition to implementing a new telephone system, noticed overall improved patient

satisfaction (Healthcare Advisory Board, 1999). However, telephone service improvements did not rectify the low patient satisfaction scores among the senior citizen population (Healthcare Advisory Board, 1999).

Success requires the marriage of technology, personnel and service. There are many variables affecting performance, and they are constantly changing. Thus, an organization must combine the right technological tools with sound business practices, which are built on key operational data.

An integrated delivery system requires the management of information across all components of care. Barriers to this kind of information sharing include: insufficient resource allocation, lack of ownership by top management, and the large variety of information needs (Mead, Powell, & Sevilla, 1996). In healthcare our product is the patient, our process is the service and treatment provided. The outcome is patient wellness. Healthcare organizations must be committed to creating a better, more efficient environment for the delivery of healthcare.

# Chapter 2

# METHODOLOGY

## Process Redesign

In keeping with the Naval Medical Center's corporate culture, this study followed the precepts of Continuous Improvement. Continuous Improvement uses the FOCUS–PDCA Model. It requires the identification of a problem, the use of flowcharting to understand the process, and uncovering the causes of process variation and poor quality. The following methodologies are included: internal and external benchmarking for best business practices, review of existing data from Command Surveys and conducting a survey of staff morale. A matrix analysis was conducted comparing existing processes of the three clinics under study (Pediatrics, Internal Medicine, & Primary Care) to see what works best. The best practices as well as any other benchmarks were incorporated into an "idealized" patient telephone appointment process redesign.

This study uses a constrained idealized redesign, which begins with the assumption that the organization's environment remains unchanged (Ackoff, 1984). This eliminates the need for forecasting its future environment. Instead, assumptions are

used in decision-making. Such a design is subject to three constraints: the organization designed must be technologically feasible; it must be operationally viable; and the design must be subject to continuous improvement—capable of rapid learning and adaptation (Ackoff, 1984).

Each clinic was evaluated independently, as the only commonality was telephone access to the healthcare system. The current process in each clinic was defined using system requirements and performance variables to include: location, number of attendants, number of lines per attendant, automatic call distributor (ACD), time of day, attendant type, number of times on hold, length of time on hold in minutes, total call processing time, service performed etc. See Appendix (A) for a complete variable list and variable coding. Continuous variables were recoded to perform logical groupings for purposes of cross tabulation and application of chi square test. The process was flowcharted and evaluated for needless process complexity and redundancy. With the guidance of NMCSD staff statistician, Dr. Ken Brodeur, a data collection tool was developed and administered at the point of service. Application of power analysis at 95% confidence level, based upon 1000 calls per week, indicated the requirement for a sample of 270. There were 90 samples collected from each clinic. The tool measured system specifications and performance. Based on the analysis of the

previously identified system specifications and performance variables of the current system, requirements for an optimal telephone appointment system were determined. These requirements included the application of technology, optimal staff mix, training requirements, industry benchmarks, best design practices, and logistical design.

Impact of Morale

To address the relationship between the impact of morale on the “idealized” process, especially as it affects productivity, a valid Command climate survey instrument (Cronbach alpha of .98), was used to extract various questions based upon their correlation to staff morale. The top 27 questions that had the highest correlation value with morale were selected (Pearson’s correlation of .475 or greater). The 27 questions were then be administered to the entire population (Appendix B). The results were interpreted using the Statistical Package for Social Sciences (SPSS). Basic statistics (mean, frequencies, and distribution) were examined. Morale was cross-correlated with questions that predict morale. The Cronbach alpha on the resulting instrument when used with this population had a score of .90.

Census sampling was used. Due to the small sample size, statistical significance was determined at the .10 level versus the traditional .05. The data was recoded as clerk versus nurse

for job category comparison. This allowed for two reasonably sized groups for the purpose of statistical analysis. Also, the five-point Likert scale was collapsed into a three-point scale (Agree, Disagree, Neutral) for purpose of statistical analysis.

Hypotheses

**$H_1$**: There is no statistical difference in system performance by clinic.

**$H_2$**: There is no statistical difference in call processing time whether a clerk or a nurse handles the call.

**$H_3$**: There is no statistical difference in call processing time whether the call is complicated or uncomplicated.

**$H_4$**: There is no statistical difference in call processing time whether or not an Automatic Call Distributor (ACD) is used.

**$H_5$**: There is no statistical difference in morale by pay status.

**$H_6$**: There is no statistical difference in morale by clinic assigned.

**$H_7$**: There is no statistical difference in morale by length of time assigned to the job.

# Chapter 3

# RESULTS

## Process Analysis

### *Clinic Overview*

### *Internal Medicine Department*

The Internal Medicine Clinic has a TRICARE Prime enrollment of 3789 beneficiaries of which 1810 are TRICARE Senior Prime. There are six staff physicians, 22 interns, and 22 residents. As a result of the rotation schedule of interns and residents, enrollees will not necessarily see the same provider on a follow-up visit. Clinic visits for the month of June 1999 were 3604, not including the 952 visits to the Coumadin clinic. Patients for the Coumadin Clinic, which is located in Internal Medicine, must access the system in the same manner as all other Internal Medicine primary care patients.

Patients access the Internal Medicine clinic by calling either the front desk or the appointment desk (Appendix C)). Clinic hours are Monday and Thursday 0730–1600, Tuesday and Wednesday 0730–2000, and Friday 0730–1300. The appointment desk is staffed Monday through Thursday 0730–1600, and Friday 0730-1300; whereas, the front desk remains staffed as long as the clinic is open.

The front desk is located at the entrance of the clinic with a requirement for two clerks. Clerks are responsible for answering the phone, for performing various administrative

duties, and checking patients in for daily clinic, to include the Coumadin clinic. Each clerk is responsible for answering seven telephone lines. The queue holds twenty callers. There is no audix to inform the patient that he is in queue. Rather, the caller will just hear a continuous ringing. Hence, the patient does not know he has reached clinic and may assume the clinic is not open. If the call is complicated and requires triage, the clerk will take the message and deliver it to the treatment room nurse. If the call requires a message for the physician or a medication refill, the clerk instructs the patient to call the appointment desk. Patients may be placed on hold several times in an attempt to make an appointment, as clerks are performing administrative duties and checking in those patients presenting with scheduled appointments.

The appointment desk is located in the center of the clinic, adjacent to the satellite lab and pharmacy. Patients may make appointments in person at this site. There is a requirement for two clerks, each responsible for answering nine telephone lines. The telephone queue can hold twenty callers. Clerks are also tasked with administrative duties. Patients who call requesting an appointment during peak hours, or when the appointment desk is short-staffed, are instructed to call the front desk. Callers may be placed on hold several times as clerks attempt to balance the workload--completing assigned administrative duties, answering the other eight telephone lines, and making follow-up appointments for Coumadin clinic and Internal Medicine clinic walk-up patients.

Process analysis (Appendix D) reveals the current process is not an optimal one due to numerous decision points and re-loops which add unnecessary complexity to call processing. Clerks perform multiple tasks functioning parallel to one another. These individual processes are being treated as an integrated process, when indeed they are not. There are also patient flow logistics to be considered. Service is provided in the clinic, in two physical locations that are not co-located, making it difficult for the telephone service representative to effectively manage the workload at both work-stations. There is a requirement for two clerks at each desk, but on any given day actual staffing is one-half of this requirement causing additional problems in providing service to the customer. Staffing shortage has a compounding effect: Other tasks divert the clerk from his primary function, thus exacerbating the problem. Seventy to eighty percent of productivity is lost with less than optimal staffing.

Training for the telephone service representatives (TSR) consists of only a two-day CHCS course. Standard Operating Procedures (SOP) manuals are non-existent. Hence, clerks must frequently seek guidance. Supervisors are not located in the immediate workstation--which further adds complexity to the process. For a complicated call, the clerk places the patient on hold, leaves the workstation unattended, and seeks management

assistance. In the interim, all available lines are ringing, calls are stacking in queue, and the queue at the work-station also continues to lengthen. Better training to include refresher training and the use of standard operating procedure manuals could improve productivity and call processing time.

The Clinic does not have an Automated Call Distributor (ACD) nor voice processing of any type i.e. automated attendant, digital announcers, and voice mail. Thus patients in queue will continue to hear the telephone ringing, thus not knowing if the clinic is open or if they even reached the correct clinic. This process problem can result in the clinic not meeting access standards.

*Pediatrics Clinic*

The Pediatrics clinic has a TRICARE Prime enrollment of 11,138 beneficiaries, with clinic visits for the month of June 1999, totaling 7036. Staffing consists of 14 Pediatricians, 23 Interns and Residents, and eight Nurse Practitioners. Patients access the system by calling the appointment office located to the rear of the check in desk. Clinic hours are Monday through Friday 0800–2000, and weekends and holidays 0800–1600.

Required staffing of the appointment office is one GS4 clerk and three registered nurses. The clerk is required to book well baby check appointments and take phone messages for the

provider. He is responsible for seven incoming lines with as many as 20 callers in queue (Appendix E). The clerks work an eight-hour shift. Clerk hours are from 0800–1600 Monday through Friday. Training consists of a two-day CHCS course.

Pediatrics has an ACD and Call Management System (CMS) software to monitor staff performance, number of incoming calls, and patient waiting time in queue. The Call Management System can only track the number of calls once they reach the queue. If the queue is filled, the CMS will not track the call nor report abandoned calls. Pediatrics has a phone tree. A voice messaging subsystem provides announcements and caller prompts with prerecorded words, phrases, and sentences. Patients access the system by calling the phone room. The caller uses the telephone keypad to select from the options presented: option #3 for nurse, #4 for well-baby check, #5 to reschedule, and #6 to leave a message for the doctor. Options #4, #5, #6 are routed to the one clerk in the phone room (Appendix E). The phone room is staffed by at least one nurse as long as the clinic is open. Customers calling for well baby check appointments, cancellations, or messages for a provider must call Monday through Friday 0800–1600.

Nurses work two-hour shifts in the phone room and then rotate in to clinic. The greatest volume of calls occurs during peak clinic hours. Each nurse has a phone with two incoming lines: patients may be stacked up to twenty in the queue. Nurses also perform other administrative duties while in the phone room to include entering into CHCS walk-in patients and

clinic consults. The nurses may also be pulled from the phone room to assist with triage at the check-in desk. This can have a dramatic impact on patient waiting time. Once a caller has been placed on hold by an attendant, the call cannot be forwarded to the next available person. Thus, one attendant may have several people on hold, while the other three attendants are free.

Process analysis reveals mismanagement of call flow and reloops, which add unnecessary complexity and time to call processing (Appendix F). For example, a customer who calls to make a well-baby-check appointment would select option #4. If the mother states her child also has had a slight cold, or if she requests anything other than a well baby check or cancellation of appointment, the clerk instructs the mother to call back and select option #3 for nurse versus transferring the call. This forces the customer to go back into the queue, which may have a significant wait time. Should the nurse then decide the patient doesn’t need an acute appointment, but rather a well baby check, the mother is instructed to call back and select option #4, versus the nurse booking the appointment herself. Patients are forced to make an appointment for a well-baby check or to talk with a nurse. Clerks are not empowered to make routine appointments. There are greater than twenty appointment types for the Pediatrics Clinic. Customers requiring a routine or acute appointment must wait in queue to speak with a nurse. Also, there is no dedicated line to communicate with internal customers. The use of technology, in particular the Automatic Call Distributor, has not created an optimized system.

On any given day, nurse staffing is less than optimal. There are no standard operating procedure manuals for the clerk nor process algorithms for nurse triage. More experienced nurses are required but unavailable due to staffing limitations. In many cases, the nurses have less than four years nursing experience.

Rotating the nurses every two hours is an attempt to improve morale and efficiency as these nurses also assist with the walk-in clinic. The clerk and nurses work in a room of approximately 70 square feet. This is due to space limitations in the clinic. Breaks are infrequent and often non-existent. This is due to staffing constraints within the clinic.

*Primary Care Clinic Group*

The Primary Care Clinic Group consists of three clinics of which two are geographically distinct from the Naval Medical Center. Staffing consists of active duty and contract physicians and contract medical assistants. Prime enrollment for the Naval Medical Center Primary Care Clinic (PCC) is 13,678, of which 849 are TRICARE Senior Prime (TSP); for Naval Training Center Primary Care Group (NTC PCG) 4481, of which 670 are TSP; for Coronado PCG 1683, of which 171 are TSP. Total visits for the month of June 1999, were 5748 for PCC, 790 for NTC PCG, and 534 for Coronado PCG. Clinic hours are Monday through Friday 0700–1900, Saturday, Sunday, and holidays 1000–1800. Phone access can only be obtained during the hours of 0730–1600 Monday through Friday.

Naval Medical Center Primary Care Clinic staffing consists of one active duty physician, one civil service physician, five to seven contract physicians, and five contract medical assistants. The physicians work eight to twelve hour shifts. There are two physicians with scheduled appointments on Saturday and one physician on Sunday.

Patients requiring an appointment at any of the three primary care clinics must call the front desk located in the lobby at the Primary Care Clinic. Five GS-4 clerks are responsible for answering the phones. One of the clerks is responsible for making appointments for walk-up patients as well as performing other administrative duties. The remaining clerks make appointments for the three primary care clinics. Calls are routed to next available attendant. Clerks are responsible for one line each (Appendix G). Ten people may be stacked in the queue. The supervisor remains in the vicinity to assist the clerks when necessary. The nurse is located in an office behind the front desk and is readily available to assist with triage. Clerks have a dedicated line for use to verify TRICARE enrollment and to communicate with internal customers. Telephone calls for physicals and pap smears are handled by the contract secretary, who works for the contract physicians.

Process analysis reveals a streamlined process resulting in efficient call processing time that comes close to industry benchmarks (Appendix H). Nonetheless, staffing is less

than optimal as five clerks are booking for three separate and busy clinics. Also, patients cannot access the system after 1600 Monday through Friday nor on Saturday and Sunday when the clinic is open.

Logistical issues must also be considered. Telephone service representatives are located in the lobby of the Primary Care Clinic and are subject to numerous interruptions. This is due to space limitations within the department. Training consists of the two-day CHCS course with on the job training provided by the supervisor. Extended training is not possible due to insufficient staffing available

*Analysis*

A data collection tool was developed to measure system specifications and performance. System specifications consisted of seven variables, and system performance consisted of 11 variables (Appendix A). System specifications were obtained from CHCS data and from information supplied by clinic managers. System performance was obtained by direct observation. Ninety data points were obtained from each clinic and recorded in Statistical Package for Social Sciences (SPSS). For the purposes of analysis, continuous variables were recoded as categorical variables.

Frequency analysis revealed that 68.1% of the calls occurred in the morning and 31.9% were in the afternoon. Call patterns revealed 41.5% were on Monday, 33% on Wednesday, and 24.1% on Thursday. Clerks handled 85.2% of the calls, nurses 14.8%. Patients were put on hold at least once 50% of the time – 24.4% were placed on hold for one to two minutes and 26.7% were placed on hold for three or more minutes. Ninety-one percent of the calls were uncomplicated (defined as requiring no management assistance). Fifty-seven percent of the calls took four minutes or longer to process. Calls processed included 47.8% for appointments, transfers 10.7%, general information 10.7%, triage 13.7%, and message for provider 17%.

Figure 1. Time of Day Patient Calls

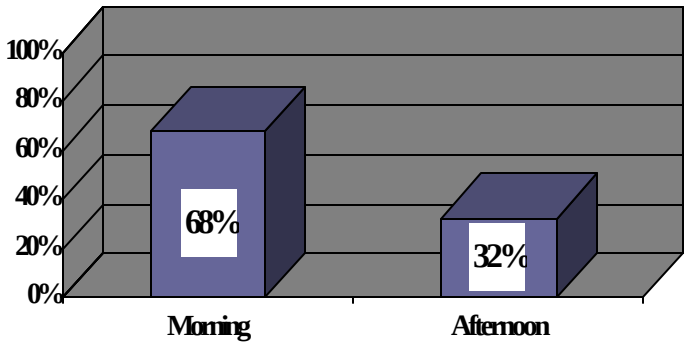


Figure 2: Are Calls Received Complicated?

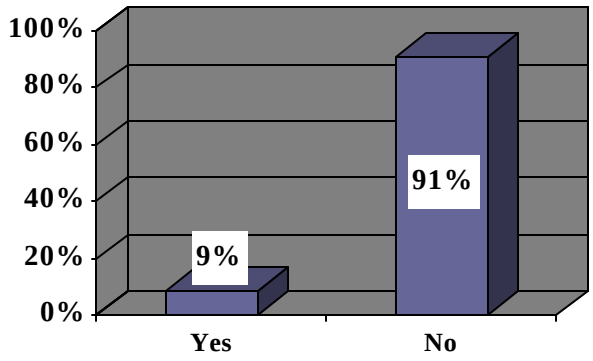



Figure 3. Percentage of Calls Answered by Attendant Type

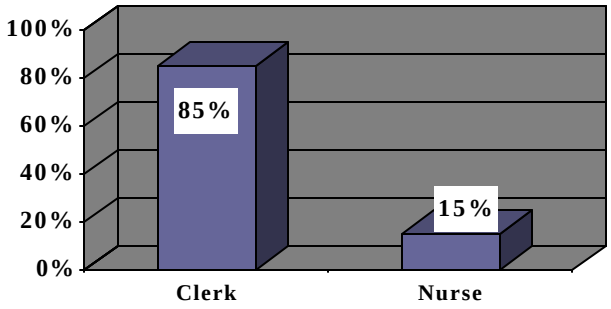


Figure 4. Number of Times the Caller is Placed on Hold

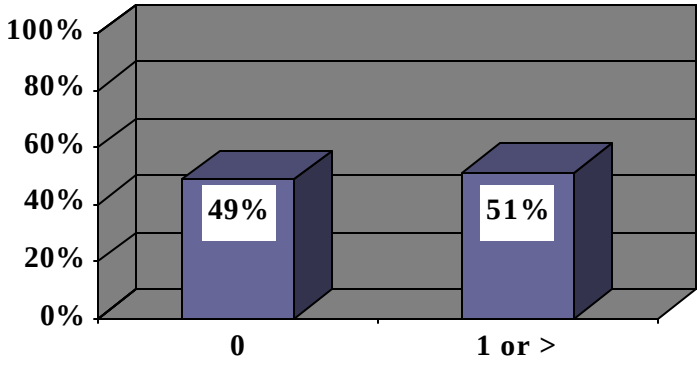



Figure 5. Total Call Processing Time

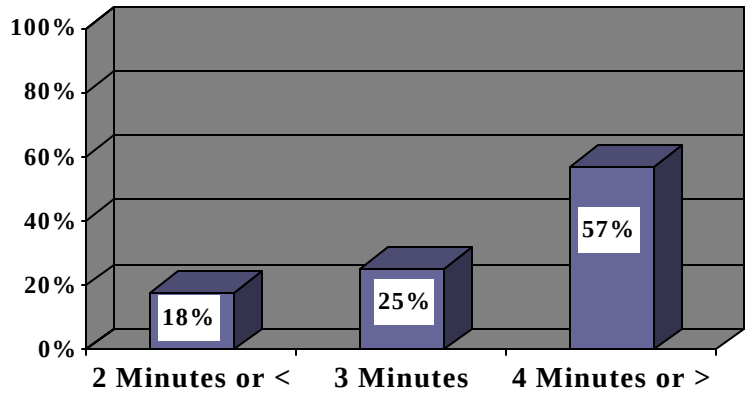
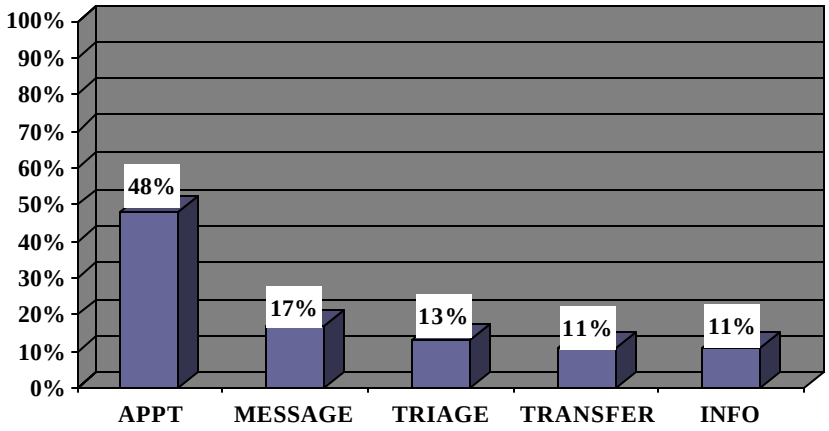


Figure 6. Service Provided




Services provided include: making an appointment, taking a message for the provider, triage, transferring the call, & providing general information.

Performing a Pearson Chi-Square test on cross tabulation between times put on hold and number of attendants revealed that patients were less likely to be placed on hold when there were three attendents as 68.9% were put on hold at least once with two attendants, 40.6% with three attendants, and 75.6% with four attendants ($p = .000$).

When comparing differences between TSR's with and without ACD's the statistical analysis revealed that patients who contacted a TSR with an ACD were more likely to be placed on hold at least once as seventy-one percent of the customers who called a clinic with an automatic call distributor (ACD) were put on hold at least once, compared to 41.1% of those who called a non-ACD clinic ($p = .000$).

Fifty-two percent of the calls in the morning and 48.8% of the calls in the afternoon were put on hold at least once.

When comparing times put on hold by attendant type, statistical analysis revealed callers who reached a nurse were more likely to be put on hold as 77.5% of callers who reached a nurse were put on hold at least once, compared to 46.5% of callers who reached a clerk ($p = .000$). Callers who reached a nurse were placed on hold in excess of three minutes 60% of the time, compared to only 20.9% of the time when reaching a clerk ($p = .000$). Call processing time was greater than four minutes 87.5% of the time for nurse attendants compared to 51.8% of the calls for clerks ($p = .001$).

Performing a Pearson Chi-Square test on cross tabulation between total time and service provided revealed total processing time to be greater than four minutes for 53.5% of patients requesting an appointment, 20.7% of patient transfers, 39.3% of patients requesting general information, 91.9% of patients triaged, and 73.3% of patients leaving a message for the provider.

*Clinic Comparisons*

All data was analyzed using cross tabulation and Pearson Chi-Square test. Based on comparison between length on hold in minutes and location by clinic: Pediatric patients were put on hold three minutes or longer 51.1% of the time, 27.8% for Internal Medicine patients, and 1.1% for Primary Care Clinic

patients (p = .000). Based upon comparison between total call processing time and location: Pediatrics call processing time was greater than four minutes 74.4% of the time compared to 58% for Internal Medicine, and 38.9% for Primary Care (p = .000).

There were no other statistically significant differences among clinics in any of the other relevant system requirements and system performance variables in the study.

Figure 7. Times Put on Hold by Location

- Patients are far less likely to be put on hold when calling the Primary Care Clinic as compared to the other clinics
- P =.000

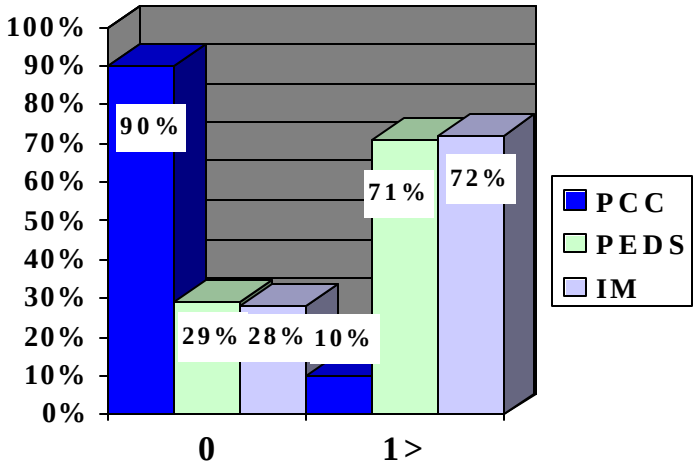


Figure 8. Times Put on Hold by Attendant Type

- Patients are more likely to be put on hold when speaking with a nurse.
- P =.000

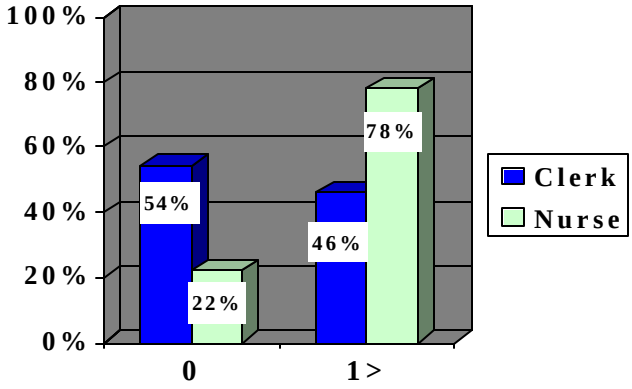



Figure 9. Times Put on Hold by Service Provided

- Patients requiring triage are put on hold more often than those who request an appointment.
- P =.000

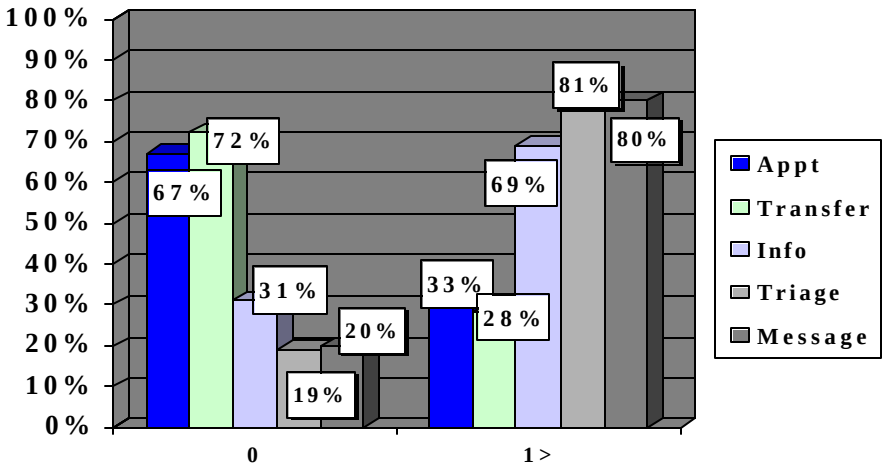


Figure 10. Length on Hold by Location

- Patients are more likely to be put on hold 3 minutes or greater when calling Pediatrics.
- P =.000

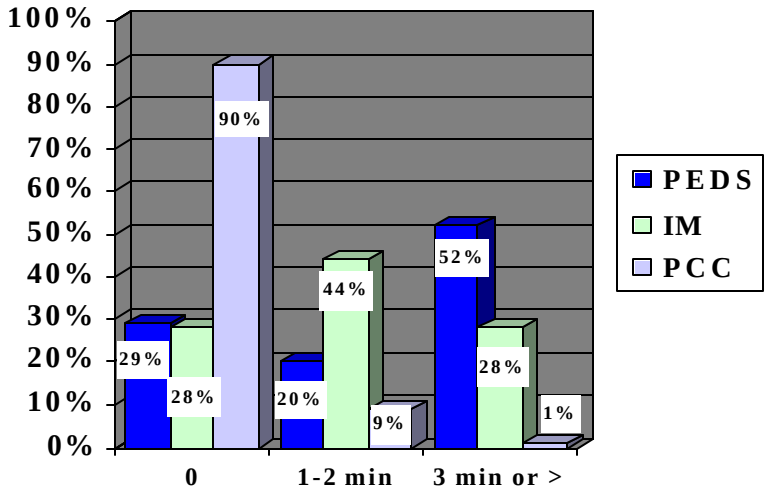
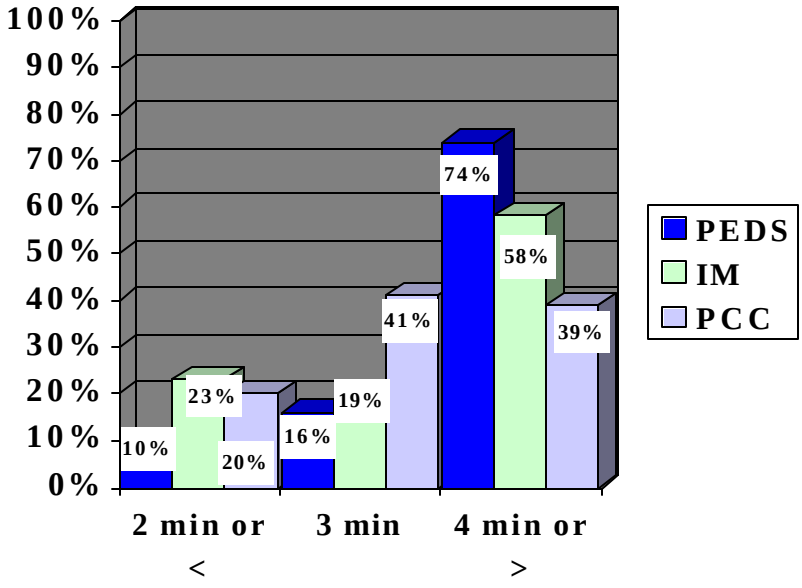



Figure 11. Total Time to Make an Appointment by Location

- Call processing time is most likely to be > 4 minutes when calling Pediatrics
- P =.005



## Relationship of Morale to Idealized Process Redesign

### *Population Profile*

Survey population consisted of eight nurses and sixteen clerks. Job status indicated fifteen attendants were civil service, eight were contract personnel, and one was military. Respondents consisted of 14 telephone service representatives from Pediatrics, four from PCC, and six from Internal Medicine Clinic. Four telephone representatives worked 0–2 hour shifts, ten individuals worked 3–6 hour shifts, and ten personnel worked shifts that were six hours or more in length. Sixteen individuals (67%) reported less than one year of experience.

### *Findings*

Survey results were obtained and recorded in SPSS. Frequency distribution revealed only 29.2% of attendants agreed that workers are kept fully informed when changes are made in the appointment process, 16.7% were neutral. Forty-six percent of attendants reported that they enjoyed working at the job, 33% were neutral. Fifty-eight percent of attendants disagreed that they are told promptly when changes in policy are made that affect them. Fifty percent of attendants disagreed that leadership could be trusted. Also, thirty-three percent agreed that the clinics provide on-the-job training to optimize job effectiveness.

Forty-one percent of attendants agreed that the supervisor asks their opinion when a problem related to their work arise. Seventeen percent of attendants agreed that they had authority

to make improvements in their own work process. Sixty-three percent agreed that they had enough training to do the job well, and 41.7% agreed that individuals and teams are empowered to make suggestions for improving Command services. Thirty-six percent of attendants reported their job satisfaction as above average, 21% reported average.

Figure 12. “I Enjoy Working at this Job.”

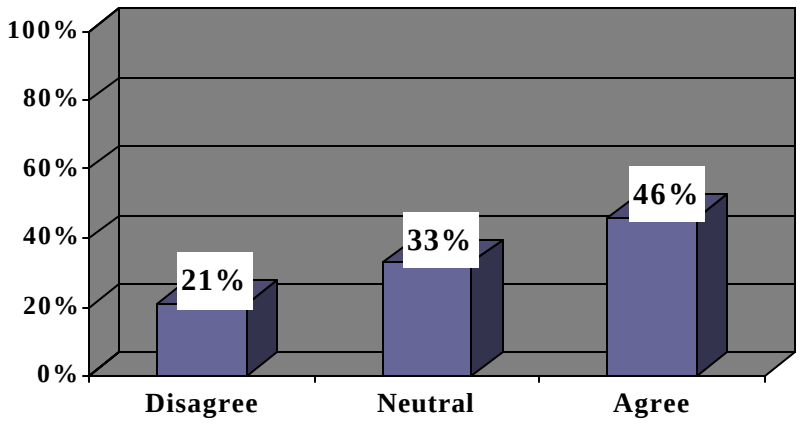


Figure 13. "My Clinic Conducts On-the-Job Skills Training to Optimize My Job Effectiveness."

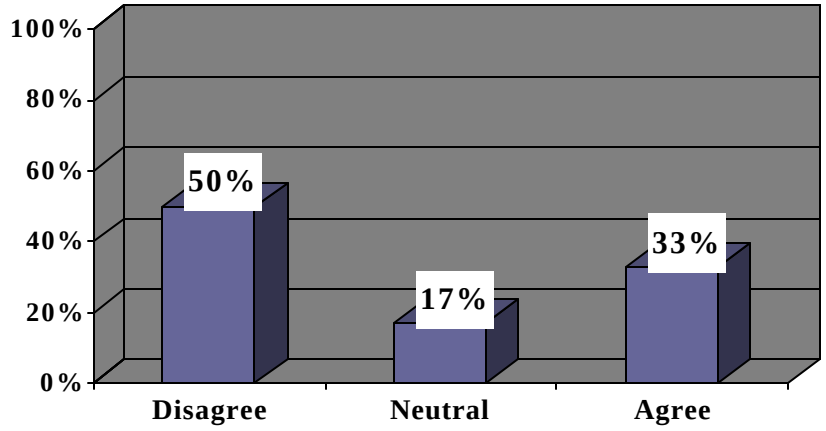



Figure 14. "I Have Enough Training to do My Job Well."

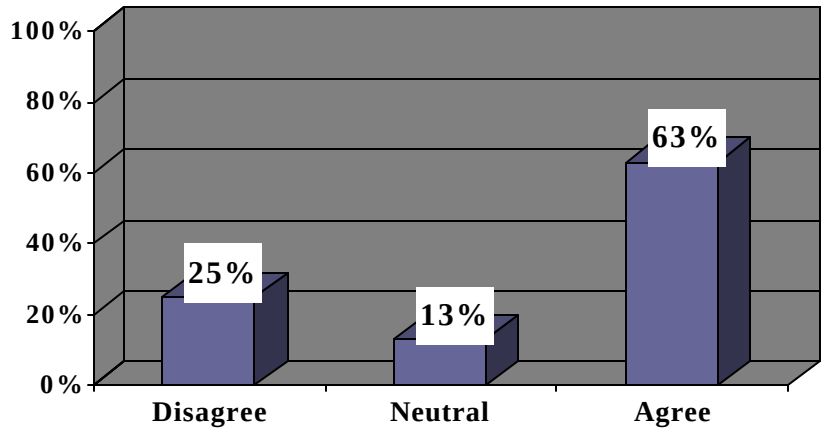
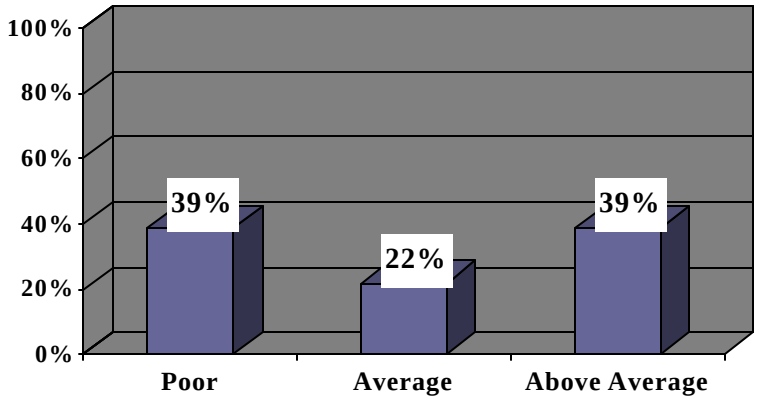


Figure 15. “My Job Satisfaction Is”




All data was analyzed using cross tabulations, Pearson Chi-Square test, and a test for linear association. Cross tabulation between job status and workers kept fully informed when changes are made in the appointment process revealed 85.7% of nurses disagreed, compared to 43.8% for clerks (p = .086). One hundred percent of the nurses disagreed that they are told promptly when there is a change in policy that affects them, compared to 43% for clerks (p = .012). One hundred percent of the nurses disagreed that the clinic is effective in providing recognition, compared to 43.8% of clerks (p = .039). Seventy-one percent of the nurses disagreed that they had the opportunity to influence what goes on in the clinic, compared to 37.5% for clerks (p = .094). Eighty-six percent of the nurses disagreed that the department recognizes outstanding individual and team performance, compared to 37.5% for clerks (p = .053).

Clinic comparisons revealed 33.3% of the telephone service representatives in PCC, 50% in Internal Medicine, and 71.4% in Pediatrics disagreed that they are told promptly of changes in policy that affects them (p= .043). Sixty-seven percent of Internal Medicine agents disagreed that department decisions are made in a timely manner, compared to 50% for Pediatrics. There was no reported disagreement in Primary Care Clinic. Thirty-three percent of personnel assigned to PCC reported productivity as above average or excellent, compared to 84.6% for Pediatrics, and 100% for Internal Medicine (p = .057). Thirty-three percent of the agents assigned to PCC reported morale as poor, compared to 46.2% in Pediatrics (p = .054). No agents assigned to Internal Medicine reported morale as poor.

Comparisons based upon length assigned to position revealed 26.7% of the telephone agents with less than one year disagreed that the clinic is effective in providing recognition, compared to 80% disagreement for those assigned 1–3 years, and 100% of those assigned greater than three years (p = .078). Forty-four percent of agents with less than one year on the job disagreed that they had an opportunity to influence what goes on in the clinic, compared to 40% disagreement for agents assigned 1–3 years, and 66.7% disagreement among agents with greater than three years on the job (p = .078).

Thirty-one percent of agents with less than one year disagreed that the department routinely recognizes outstanding individual and team performance, compared to 80% disagreement for agents assigned 1–3 years, and 100% of agents with three or

more years (p = .049). Thirty-one percent of agents with less than one year disagreed that individuals and teams are empowered to make suggestions for improving Command products or services, compared to 40% disagreement for those assigned 1–3 years, and 100% of agents assigned greater than three years (p = .080).

The survey revealed very high dissatisfaction overall. Scores were much lower than Command scores as a whole. Linear tests reveal as time increases on the job, morale decreases. In eight out of ten indicators, as time increases on the job, satisfaction decreases. Attendants expressed inability to provide appropriate information to patients, resulting in angrier patients. Also attendants reported “abuse” by patients when citing rules and policies that the patients find restrictive.

Figure 16. “Workers Are Kept Fully Informed When Changes Are Made in the Appointment Making Process.”

- Nurses disagree more often than clerks that they are kept informed.
- P =.086

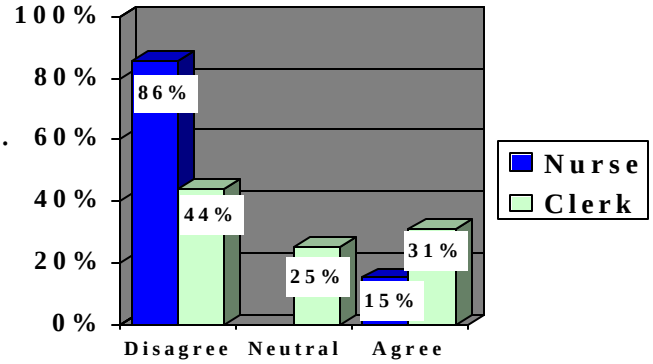


Figure 17. “I Am Told Promptly When There Is A Change in Policy That Affects Me.”

- Nurses disagree 100% of the time that they are told of changes in policy that affect them.
- P =.012

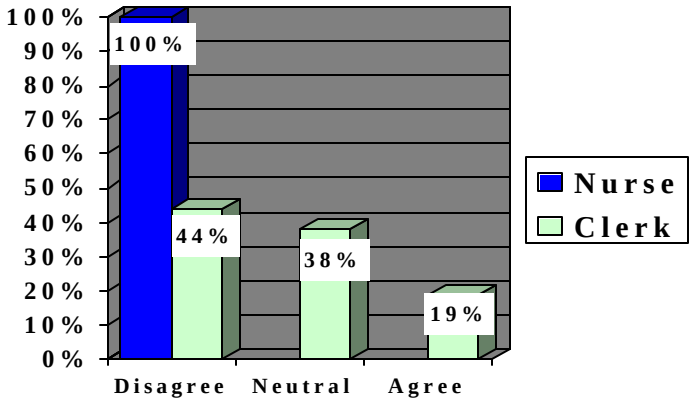



Figure 18. “Department Routinely Recognizes Outstanding Individual and Team Performance.”

- Nurses disagree more often than clerks that outstanding performance is recognized.
- P =.053

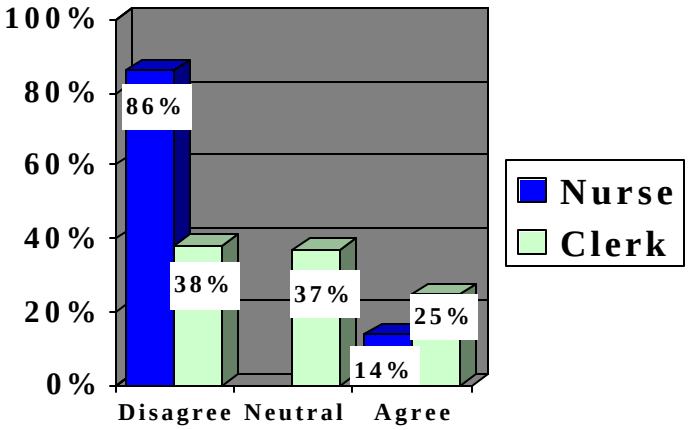


Figure 19. “I Am Told Promptly When There Is A Change in Policy that Affects Me.”

Attendants in Internal Medicine agree more often than those in Pediatrics & Primary Care that they are told promptly when there is a change in policy that affects them.
P =.043

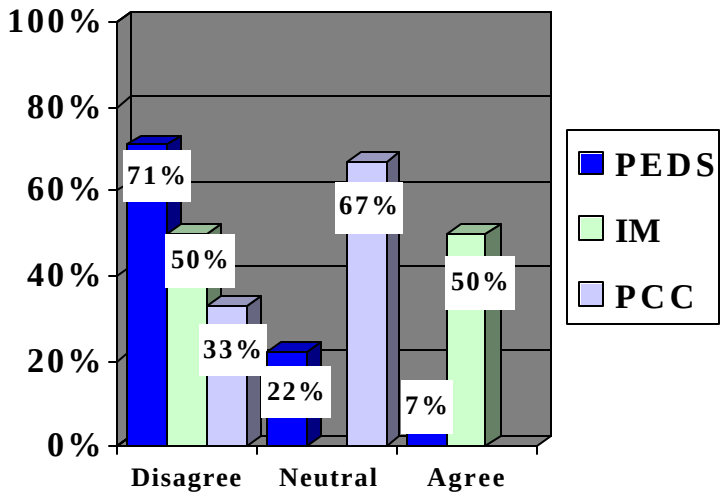



Figure 20.” Considering My Time on the Job, the Department Routinely Recognizes Outstanding Individual & Team Performance.”

- The longer agents have been assigned to the job the more likely they are to disagree that there is adequate recognition of outstanding performance.
- P =.049

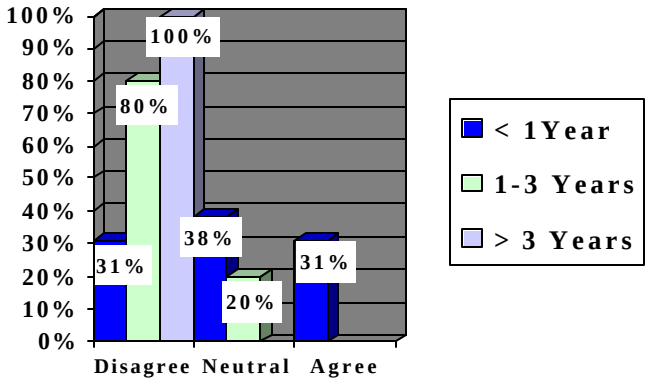
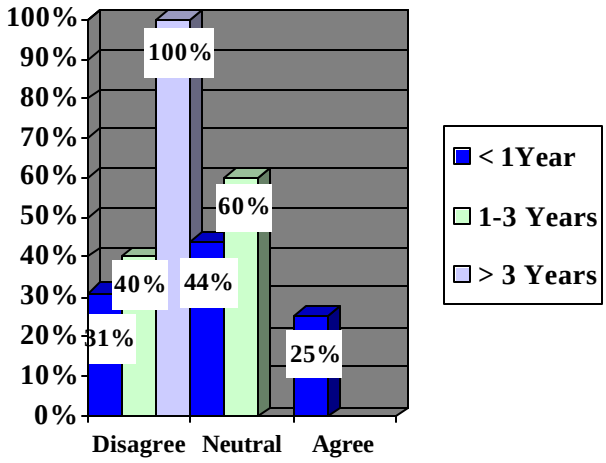


Figure 21. “Individuals and Teams Feel Empowered to Make Suggestions for Improving Command Products or Services.”

- The longer agents are assigned to the job the less empowered theyts feel about making suggestions to improve Command services.
- P =.080



Hypotheses Testing

**$H_1$**: There is no statistical difference in system performance by clinic. In this instance, the null hypothesis can be rejected, with Primary Care having a much higher level of performance compared to the other clinics.

**$H_2$**: There is no statistical difference in call processing time whether a clerk or a nurse handles the call. The null hypothesis can be rejected, with call processing time being greater when a nurse answers the phone. Differences can be attributed to the types of calls handled as well as inefficiencies. Clerks take only calls requiring a well baby check; whereby, the outcome is an appointment. The nurses handle all other calls which requires triage; whereby, the outcome may be an appointment avoided.

**$H_3$**: There is no statistical difference in call processing time whether the call is complicated or uncomplicated. The null hypothesis is accepted, with no difference in processing time between complicated and uncomplicated calls.

**$H_4$**: There is no statistical difference in call processing time whether or not an Automatic Call Distributor (ACD) is used. The null hypothesis can be rejected, as call processing time was greater where the ACD feature was utilized. This demonstrates that the ACD can make processes more inefficient if not used correctly. Lack of an ACD could force repeat calls.

**$H_5$**: There is no statistical difference in morale by job type. The null hypothesis can be rejected, with nurses being more dissatisfied than clerks.

**$H_6$**: There is no statistical difference in morale by clinic assigned. The null hypothesis can be rejected.

**$H_7$**: There is no statistical difference in morale by length of time assigned to the job. The null hypothesis can be rejected, as the longer an agent is assigned to the job the greater the dissatisfaction.

*Conclusions*

Based upon the data one may conclude:

- Lack of space optimization has a significant negative effect on productivity, morale, customer satisfaction, and overall systems performance.
- Lack of adequate staffing, training, orientation (to templates, processes, guidelines, Standard Operating Procedures) and involvement (recognition, empowerment, inclusion) has a significant negative effect on productivity, morale, and customer satisfaction.
- Appropriate use of technology is essential to systems optimization.

Process redesign can dramatically improve systems performance.

Benchmark Assessment

*Fleet Industrial Supply and Service Center*

Fleet Industrial Supply and Service Center (FISC) San Diego's primary mission is to provide U.S. Naval Forces with quality supplies and services. Its vision is to team with customers and suppliers as the regional provider of choice for best value supplies and services. FISC's Customer Information Center (CIC) provides worldwide logistics: stock availability, requisition inquiries, shipping/transportation information, expediting, process assistance, technical information, general information, and procurement. The Center also provides regional support to include: logistics, facilities, air and port operations, and quality of life services. The Center's vision is to be the single point of contact, to act upon and respond to all customers' needs. Hours of operation are 0600–1600 Monday through Friday, and 0730–1600 Saturday and Sunday.

The CIC employs 14 customer service representatives. Customers may call or email the Center. Customers calling are required to provide name, activity, and phone number. A "call profile" is then created and loaded into a tracking system. This will aid in future calls. The representative then provides the customer with the information needed as well as processes the requests. If all the information is not readily available, the CIC will call the customer back.

FISC’s Virtual Call Center offers a toll free number to its customers. The Center utilizes a Lucent Technologies DEFINITY® ECS G3 Switch. Features of the system include: call prompting, expert agent, conversant IVR, call vectoring, and world class routing. Clerks access over 35 databases through point and click technology on Windows NT. The Center uses Support Magic Software, which has built in prompts. The system has the ability to track calls by types of clients, by location, and by product requests. CentreVu Call Management System (CMS) provides an administrative interface to the ACD feature of the DEFINITY® ECS – allowing administrators to access the CMS database, generate reports, administer ACD parameters, and monitor call activities to determine the most efficient service possible for its customers. Split supervisors also have access to real-time and historical reports to help them manage the performance of their personnel.

The Center answers approximately 4500 calls a month. Performance metrics include: call processing time in four minutes or less and 89% of the calls answered within 15 seconds. The abandonment rate is 5%.

*AT&T Wireless Services Inc.*

AT&T Wireless Services (AWS) is an “inbound customer care center” located in Anaheim Hills, CA. Their mission statement is “Customer Care, Credit & Collections exceeds customer and shareholder expectations through efficient, effective and empathetic call resolution.” The regional office has over 700 telephone representatives handling in excess of 12,000 calls a day.

Training consists of three weeks of classroom lectures and computer training followed by two weeks of one-on-one training; whereby, a trainer monitors all calls. Refresher training is conducted monthly. Training consists of focusing on performance measures. Performance Measures include:

- Service Orientation - greeted customer, preserved confidentiality, established rapport, expressed empathy, maintained composure, expressed commitment to customer satisfaction, professionalism, used customer name
- Communication - animated tone, expressed confidence, enunciated, well-paced, concise, used familiar terms, grammatically correct
- Addressing the Issue - asked clarifying questions, listened actively, took ownership, met customer expectations, conveyed industry expectations, conveyed benefits

- Expanded Business Opportunities - Identified business opportunities and offered a solution, transitioned smoothly, asked for the order
- Call Management - controlled call, extended hold courtesies, minimized dead air, transferred call appropriately
- Closing the Call - recapped the call, offered additional assistance, terminated the call properly

Each workspace consists of approximately 45 square feet. Workstations are ergonomically designed. Desks can be adjusted so that the representative may stand if desired. Foot rests, wrist pads, and ergonomic chairs are provided. A fitness room is available on-site 24 hours a day.

AT&T Wireless utilizes Lucent Technologies DEFINITY® ECS G3 switch. It also utilizes CentreVu Call Management System to chart and analyze historical and real-time reports. The Center has five ACD lines including: general ACD, Hispanic ACD, high value customer ACD, voice mail ACD, and overflow ACD to Jacksonville, FL. The Center also utilizes many other features of the DEFINITY® ECS to include: expected wait time, skills-based routing, and call vectoring.

The agents use a Call Master IV Lucent Technologies phone. These phones allow the telephone service representatives (TSRs) to sign off of phones by merely pressing one of the identified buttons on the keypad denoting training, break, lunch, or end of shift. This allows for better management of the representatives,

as well as an avenue to look at the percentage of time allowed for training. The supervisor uses a supervisor’s telephone to assist with monitoring the performance of the TSRs.

AT&T Wireless has a contract with Teknekron Inc. for call recording. Work-force management (WFM) software is used for predictive scheduling. AT&T Wireless also has a contract with Assessment Solutions Incorporated (ASI), a third party quality management organization. ASI consists of behavioral psychologists that monitor the quality within the call center. Units monitored include: customer care, customer relations, corporate care, and vendors. Monitoring is objective, consistent, and customer focused. This program serves to drive the Center’s performance management programs, training initiatives, and customer initiatives. ASI monitors eight calls per representative per month. There is an immediate hotline for egregious behaviors. ASI provides performance reviews monthly and informal reports bi-weekly. ASI provides training for supervisors, managers, and representatives (coached role-play workshops). ASI simulates calls for training (actual calls that are scripted out and then simulated).

Also, Gallop surveys 300 customers within 24–72 hours of calling AT&T Wireless. Reports are sent to the regional office monthly.

AT&T Wireless has extensive Marketing and Information Management Departments, as well as coordinators who go out in to the field to work with high valued customers.

National Customer Operations Goals are people, quality, and profit. Some of their goals are as follows:

People: Minimum of 40 hours annual refresher training for all employees. Improve employee retention by 5%, continue to hold team feedback meetings in all Centers, reward employees for good results and recognize their individual and team contributions.

Quality: Implement standard QA process in every inbound Care Center, Implement “Triple A” – (Adherence, Accuracy, Attitude) program nationally, reduce repeat calls by 25%, Strengthen Integrated Care Process, Respond to all escalations within 24 hours--resolution within 72 hours.

Profit: Implement proactive retention, including high value customer (HVC) Care, outperform the competition, continue to develop and improve E-Care – targeting 500,000 users by the end of the year. Review, identify, and implement best practices in call centers.

*Kaiser Permanente*

Kaiser Permanente has over 1/2 million beneficiaries in southern California. Kaiser operates several call centers: People Solutions – Serves the entire state of California for human resource issues; California Service Center – Serves the San Diego area for plan enrollment; and the Appointment Center – Serves Primary Care, Internal Medicine, Pediatrics, and OB/GYN in the San Diego area (11 clinics).

The Appointment Center initiative began approximately seven years ago, when Kaiser Permanente's appointment system was totally decentralized. The El Cajon Appointment Center has been in operation now for approximately four years. The Appointment Center required a six-week phase-in of the clinics. The Center makes appointments for Primary Care, Internal Medicine, Pediatrics, and OB/GYN, at 11 clinics in San Diego. Appointments are not standardized. The Appointment Center hours of operation are 0700–1900, seven days a week.

The Chief of Primary Care and the Department Administrator are responsible for the eleven PC clinics. Assistant Department Administrators work at the clinic level. Each clinic has a Module Coordinator (must be a physician) for every module within that clinic. There is a Module Coordinators meeting every month to address scheduling issues. Scheduling templates are available eight weeks in advance. Schedules are submitted monthly to the master schedulers. Once same day appointments are filled (early am), patients are given an evening appointment in the Urgent Appointment Clinics (UACs). Kaiser Primary Care physicians and Per Diem doctors staff the UAC. This varies by appointment demand.

Every patient is assigned a PCM by name. Once assigned (patients may select their own PCM), a picture of the physician and his resume is sent to the new member. This information may be requested prior to selecting a PCM should the patient so

desire. It is estimated that each plan member makes one call per two month period. The Appointment Center receives 250,000 calls per month.

The Appointment Center staff consists of a an Appointment Center Manager, LAN Administrator with support staff, Data Support Coordinator, clerical support, Operations Manager who is responsible for seven floor supervisors, two staff schedulers, two Quality Assurance trainers, six master schedulers, and 162 service representatives (112 FTEs). There is a 22% turnover rate for service representatives.

Hiring of service representatives previously was accomplished through shift bidding i.e., representatives worked on requested shifts. This has changed due to the need for flexible scheduling in order to accommodate a fluctuating volume of calls. The Appointment Center now hires “On Calls” who work twenty hours a week with no set schedule. After four months these representatives become regularly scheduled part-time with benefits. Of the 162 representatives 14 are full time, 34 are “on call”, and 114 are part time employees.

Representatives receive one week of training on the appointment guidelines (LOTUS notes) and the outpatient appointment system (OPAS). LOTUS notes folders include: office and department overview; providers by department, last name, and specialty; directions; department guidelines; appointment types and description; general information (by category to include claims, mammograms, providers, telephone numbers, and location); symptoms and guidelines; health education (classes offered by

Kaiser); and Kaiser policies. All employees receive “News by Date”. This is a daily message sent to agents to inform them of changes, problem areas, and news for that day.

Agents also receive three weeks of system training (use of the phones, transferring calls, customer service, clinic orientation). Customer service requires that the agent greet each patient by name, inform the patient to arrive 15 minutes early, and in closing ask if the patient needs anything else. The final phase consists of the agent handling live calls under supervision for three weeks.

Kaiser has contracts with CISCO for hubs and routers, with COMPAQ for computer maintenance, and with Nortel Networks for current switch maintenance. Future switch procurement will be with Lucent Technologies as telecommunications contracts for Kaiser Permanente are now procured on a nation-wide basis. This allows for standardization as well as economies of scale.

Kaiser Appointment Center (AC) utilizes a Nortel Meridian SL100 switch and has 12 T-1 incoming lines. The T1 line can take 24 calls simultaneously. All 800 numbers are associated with a DNIS (dummy number). All 800 numbers go through the local phone operating system (Pacific Bell) and then are routed to the DNIS number, which is terminated at the appointment center.

Kaiser AC uses a Split Route System for incoming calls. Therefore, if one of the T1 lines is blocked, there is an alternate route for disaster recovery. The disadvantage of a

Split Route System is that callers may receive a false busy through one of the central offices due to the load balance and high call volume.

AT&T is the vendor for Kaiser Appointment Center's 1-800 numbers. The cost is approximately six cents per minute, as the Center uses a regional 800 number versus a nation-wide 800 number.

The appointment center has a VRU(Voice Response Unit) ACD, which has 96 dummy agents/virtual agents. The greeting is played. The caller enters the plan number on phone pad, or he may use the language preference. The IVR then routes calls to the seven production ACD queues manned by live agents (minimum 85 agents). Production ACDs include: English (2 ACDs), Spanish, Pediatrics, Primary
Care, new member, and a default. Routing to production ACDs allows for the Call Management System to track calls by type. The first available agent or the longest waiting agent will receive the call. Queues are set up to overflow to one another.

The telephones and Call Management System (ACD MAX) were procured with the switch. Each agent's telephone, in addition to the appointment center marques and monitors, can display queue statistics by a simple push of the button.

The Center also has CTI capability. Random announcement recordings are played for callers in queue. The Center utilizes TeleCenter System Workforce Management Software for agent scheduling. Features of the system include: forecasted calls,

forecasted actual handling time (F AHT), actual handling time (AHT), required agents (REQ), scheduled agents (SCH), net loss or gain, and service level (Net SL %).

Patients who need to select a PCM or to make an appointment for Primary Care, Internal Medicine, OB-GYN, or Pediatrics must call the Appointment Center. Agents can book same day appointments as well as routine appointments. If the provider's schedule is completely booked for the day an appointment is requested, the agent may offer the patient an appointment in the evening Urgent Appointment Clinic (UAC). The schedules for the UACs are given daily to the agents, as staffing is driven by patient demand. Patients who schedule an appointment for a later date are sent a postcard reminder.

Patients can also sign on the Kaiser Permanente website to communicate with staff and other plan members. Patients may request a routine appointment at their local medical center. The patient fills out a short form on line (name, plan number, reason for appointment, and gives two time preferences). The Appointment Center will respond within 24 hours.

During the cold and flu season, the Appointment Center operates a Cold and Flu Advice Center. This office is located in the Appointment Center and is staffed with a maximum of six nurses. The agent informs Primary Care patients (those who meet the age range and have the outlined cold and flu symptoms) that there is a specially trained Medical Staff to assist with cold and flu symptoms, who can give medical advice and recommend

appropriate treatment. These nurses will also assist with appointment making if necessary. The agent then sends the message to the Cold and Flu Advice Center, where a computer printout is generated. Nurses are responsible for calling the patient back within two hours of receiving the message. If the patient insists on an appointment, versus being referred to Cold and Flu Advice Center, the agent documents in the booking remarks “C & F refused”.

The Appointment Center workstations are ergonomically designed. Agents may adjust computer desk height. Also, agents may either sit or stand. Workstation design consists of a cluster arrangement, which maximizes floor space and facilitates communication. Each workstation consists of approximately 30 square feet per agent.

The Appointment Center performance metrics are: 80% of calls answered within 60 seconds, 220 seconds total handle time, 35 second average speed of answer, and no more than two errors per 500 calls (Error to call ratio - less than .004).

*Brooke Army Medical Center*

Brooke Army Medical Center is the Army’s only Level I Trauma Center. The Medical Center’s support of San Antonio’s emergency medicine structure is unique in this nation. Brooke Army Medical Center (BAMC) and Wilford Hall Medical Center (WHMC) participate fully in the trauma and emergency medicine care of the San Antonio and south Texas civilian communities, with each military medical center receiving approximately one

fourth of the city's emergency ambulance missions. Since the two medical centers receive almost 80% of the city's penetrating trauma, typically gunshot and knife wounds, the System provides excellent training for wartime situations. BAMC and Wilford Hall are located in TRICARE Region 6 and whose Managed Care Support Contractor is Foundation Health Federal Services (FHFS). BAMC is a modern state-of-the-art, 450-bed healthcare facility which also provides graduate medical education. BAMC is involved in over 600 research protocols, with funding provided by the American Cancer society and various other for profit and not for profit organizations.

The BAMC Patient Appointing System consists of the comprehensive group of staff responsible for patient appointment operations. The Chief, Clinical Operations administers the Patient Appointing System (PAS), with assistance from Foundation Health. Members of clinical departments and services with patient appointment responsibilities are also part of the Patient Appointing System. Functions of the Patient Appointing System (PAS) office include the development, presentation, and management of provider schedules, booking patient appointments, and monitoring and managing overall patient appointing operations at BAMC. Booking via the Central Appointments Office is optional for the specialty clinics. However, Social Work, Mental Health, and Drug Alcohol Screening Departments must book at the clinic level. Responsibilities and policies are further delineated in a BAMC Memorandum, Patient Access Protocols. Appropriate patient appointing operations are essential to

BAMC's successful mission accomplishment. Because it is a complex process involving many individuals, it requires comprehensive and detailed review at all times. The Chief, Clinical Operations ensures that performance measurements are taken regularly and the data is presented to the command and senior staff for performance improvement planning.

The CHCS Managed Care Program (MCP) Module is utilized. It is intended to allow the application of managed care principals to military treatment facility patient appointing operations and to allow enhanced centralization through detailed CHCS file configurations. In the MCP, there are two types of appointment booking--primary care manager booking and specialty clinic referral booking. Referral booking is very difficult when there are numerous appointment types.

BAMC has standardized over 2000 appointment types into eleven. An indicator is required at the end of all appointment types to distinguish between Active Duty, TRICARE Senior Prime, Prime, and Standard patients. The appointment module is flexible as it allows the use of the same appointment type with a different appointment length for depending on provider. For example, an intern may be set up so that a wellness appointment for a male is allotted 40 minutes, while a staff provider is allotted 20 minutes for the same appointment. In addition, the comment field can be used for more specific information, rather than making more appointment types. To ensure that there are no discrepancies between what can be viewed by Foundation Health employees and BAMC employees, all BAMC provider schedules are

searchable through MCP mechanisms. BAMC operates on a rolling schedule; whereby, templates are available five weeks out at any given time. The PAS produces and distributes clinic report cards in efforts to ensure compliance.

The standard hours for patient appointing operations at BAMC are 0800–1600, Monday through Friday, excluding holidays and periods directed by the command. Clinics may provide appointing support to patients outside these hours at the Service Chief’s discretion. The Patient Appointing Line telephone number for BAMC is (210) 916-9900 or (800) 443-2262(BAMC). Active duty can call (210) 916-9777. After hours patients may cancel an appointment at telephone number (210) 916-3444; whereby patients leave a message on an answering machine.

In addition to the central appointments office - PAS, there is an appointment clerk located in the “medical mall” to assist customers who prefer the face-to-face contact. PAS clerks are responsible for primary care booking and specialty clinic booking. To facilitate specialty clinic booking, the hospital uses TRICARE Prime CHCS Electronic Consult Tracking System. Calls requiring triage are transferred to the appropriate clinic nurse.

The PAS office employs a total of twelve contract and government service telephone service representatives. Each representative receives four weeks of training. The PAS office receives in excess of 11,000 calls monthly. In addition to the required CHCS training, TRICARE Service Center conducts training

for the clerks regarding health plan access and benefits. Training also includes Command orientation. Clerks are then required to spend two days reading the PAS standard operating procedures (SOP) manual. This is followed by two weeks of training with headsets--listening to calls handled by an experienced agent. Week three of headset training involves the trainer listening to the trainee handle calls. Thus, the trainer is able to intervene if necessary.

The telephone service representatives (TSRs) work in open cubicles of approximately 40 square feet each. The top halves of the cubicles are plexi-glass, which facilitates communication among the clerks as well as provides a sound barrier. The telephones are digital with headsets. The PAS supervisor works in the same office. Thus, she is readily available to assist clerks as well as monitor performance. The supervisor utilizes a supervisor’s phone (p phone) provided by Nortel Networks, which can monitor at a glance the productivity of clerks (outgoing call, incoming call, personal call, patient on hold, agent signed off). The supervisor can simultaneously monitor agents while continuing with her normal duties at her desk.

BAMC utilizes a Meridian SL100 Switch by Nortel Networks. This is Nortel’s single system solution to multimedia communications in large commercial enterprises and government environments. As one of the largest, fully digital systems in use today, Meridian provides enhanced communications for organizations with single location, multi-location, or multi-

tenant requirements. The technology of Meridian SL-100 is based on digital multiplex system (DMS) modular hardware and software. It is designed to help increase employee productivity and reduce corporate telecommunications expenditures.

To ensure high levels of customer service, BAMC uses Call Center Management Information System (CC MIS) by Nortel Networks. CC MIS is the command center for the Centrex ACD Call Center, enabling the appointment center manager to view agent and queue statistics in real-time, generate a wide-variety of standard and customized reports, and execute changes to ACD parameters. CC MIS is flexible and can be partitioned with firewalls enabling one system to securely handle multiple customers.

BAMC’s Telecommunications Department manages the entire operation of the hospital’s telephone system utilizing CC MIS - accessing real-time statistics, historical information, and consolidating reports from several locations as well as on a site-by-site basis. Nortel Networks provides a terminal for the CC MIS, which monitors every ACD group on the hospital’s switch. The advantage to this system is that the supervisor can monitor every ACD group and agent simultaneously with no computer drill-downs. CC MIS gathers information from the switch. Thus, the system has the ability to track all incoming calls, even those that don’t reach the queue. The CC MIS allows the organization to establish an overflow route; whereby, customers are routed to a particular ACD based upon time and number of callers. For

example, the hospital has set parameters whereby all telephones not answered within four rings are automatically transferred to the PAS office. This helps to ensure that patients reach a live and friendly voice in a timely manner.

BAMC has also purchased an automated call reminder system, which takes appointments from CHCS and calls the patient to remind him of his appointment. Success of the central appointments may be attributed to the extensive marketing as well as the clear lines of communication between providers and administrators.

*Wilford Hall Medical Center*

Wilford Hall Medical Center (WHMC), the Air Force's largest medical facility, is a national resource, providing complete medical care to military healthcare beneficiaries in the south central United States as well as specialized care to patients referred from all over the world. Military readiness is Wilford Hall's prime mission. Wilford Hall's patient care mission includes more than 24,000 inpatient admissions per year, and one million clinic visits. The medical center serves as the national center of excellence for a number of programs. The Medical Center operates the only programs in the Department of Defense for allogeneic bone marrow transplantation and the military's only eye bank. The organization operates the Air Force's treatment and evaluation center for HIV. Also, Wilford Hall OB-GYN and neonatology programs are recognized around the world.

WHMC enjoys a proud tradition of teaching and service. The hospital saw an opportunity to build on that legacy, to streamline processes, attain new efficiencies, and provide higher levels of service to patients and practitioners as a result of the “Gateway” centralized appointments. Wilford Hall’s appointment center is similar to that of BAMC’s. The decision to centralize appointments was made based upon a Business Case Analysis (BCA) completed by Wilford Hall staff and a study completed by Kenneth P. Kentch of Health Care Management Consulting.

The “Gateway” centralized appointment system books appointments for patients needing access to primary care, health maintenance, and high volume clinics, with potential expansion to other clinics. Wilford Hall saw this as an opportunity to “delight customers with one call appointment access.” Health plan members can access the appointment system via a local telephone number or a 1-800 number.

Call center personnel include one military nurse supervisor, one master scheduler, 13 GS-5 clerks, and three triage nurses. Personnel utilize established SOPs and algorithms. Call management reports are utilized to ensure call center efficiency and timely customer service.

Schedules are submitted to the master scheduler by the 15$^{th}$ of the month, two months prior to opening. The goal of schedule and template management is to maintain a constant availability

of appointments rather than have a tidal wave pattern, in which appointment availability significantly diminishes prior to receipt of the following month’s schedule. Each clinic has a point of contact (POC) for scheduling.

Marketing proved to be vital in the success of the appointment system. Marketing initiatives included: articles in the local newspaper, base paper, and hospital bulletin; flyers at all outpatient clinics; business cards available at TRICARE Service Center, Emergency Room, ancillary service centers, and clinics; balloons at the commissary and base exchange with printed phone numbers and the effective dates; a marquee, and magnets with phone numbers for appointments and cancellations.

WHMC also uses a Meridian SL-100 Switch with upgrades from Nortel Networks. The hospital sent a request to the Base Commander to expedite the upgrading of the switch in order to achieve its goals.

*Health Care Management Consulting*

In addition to the practice based benchmarks, the following research by Kenneth P. Kentch, of Health Care Management Consulting, reports industry standards as well as provides recommendations for Wilford Hall Medical Center appointment booking (Kentch, 1996).

The report emphasized the higher the degree of centralization, the greater degree of personnel proficiency as well as optimal space utilization is required for an appointment

center(Kentch, 1996). Health Care delivery systems are able to demonstrate high service and productivity levels with centralization of telephone booking. This is due to economies of scale and the application of queuing theory to telephone call demand and the resulting staff deployment. The consulting firm recommended that performance below 55 calls per day per person be called into question as not being efficient. Many group practice call centers and central appointment centers have experienced 55/calls/day as their lowest acceptable standard of performance and many achieve and insist on 100-110 calls/FTE/day (Kentch, 1996). The minimum number of rings the client experiences prior to being answered by a person should be one to five rings (Kentch, 1996). The firm further outlines that “wait time” should be no greater than 60 seconds. Deploying staff along the demand curves could improve service and reduce “waiting time.” Two minutes is suggested as the benchmark target for talk time (Kentch, 1996). With non-standardized appointments, the transaction time is lengthened. The fewer the appointment types the better: two types are ideal, but no more than four should be utilized (Kentch, 1996).

The concept of a call center usually contains the following functions: schedule creation and maintenance, appointment booking, advice nurses, and message taking for clinicians. Once a decision to centralize is made, these other functions must be considered. The Advice Nurse function has proven to be very

important to both consumer satisfaction as well as reducing the demand for same day appointments (Kentch, 1996). Nurses working from clinical protocols approved by the medical staff are effective in Pediatrics, OB-GYN, Family Practice, and general practice Internal Medicine (Kentch, 1996).

The firm recommends that the length of the appointment horizon be 12 weeks and not less than eight weeks. Releasing appointments weekly is preferred. Releasing appointments monthly exacerbates telephone queuing problems, poor appointment booking staff performance and client satisfaction (Kentch, 1996).

The firm further emphasized that an up-to-date telephone switch that produces desired service technology as well as management information is essential (Kentch, 1996). Also, an ACD can prove helpful to beneficiaries utilizing the system. Sophisticated appointment software is also required in a centralized center.

When appointments are centralized or sub-centralized away from clinical departments, a provision must be made to quickly and courteously transfer the client to a clinical person who can assist with the timely disposition of the problem (Kentch, 1996). With regard to consults and referrals, the firm recommends booking the appointment at the time of referral. It is important to avoid prolonging the booking experience for all parties, as well as informing the patient while still in the referring doctors office of the appointment date and time (Kentch, 1996).

Of significant importance to implementing a centralized appointment center is to flow chart the call process for all clinical departments to be served: it should be considered a priority (Kentch, 1996). Space and technology must support the strategic planning steps to be undertaken.

*Naval Hospital Jacksonville*

Naval Hospital Jacksonville is a general medical and surgical hospital offering both inpatient and outpatient care to active duty service members and beneficiaries. The hospital has the Navy's largest Family Physician Training Program. Located in Region 3, the hospital and its nine branch clinics serve a beneficiary population of more than 240,000 people.

Naval Hospital Jacksonville established a Central Appointment Office (CAO) to work in concert with the TRICARE Service Center. Together these offices assist beneficiaries in gaining access to the healthcare system. These customer service oriented centers provide a variety of services using the concept of "one-stop shopping". Beneficiaries find answers to TRICARE questions, benefit coverage, and schedule appointments via a single contact (visit or telephone call).

The CAO employs 15 clerks who take approximately 7000 calls a week. The Center books routine and specialty appointments for 27 clinics. The Managed Care Module of the Composite Health Care System (CHCS) is used to track consults/referrals to the patient level. The CAO does not schedule civilian network appointments.

The TRICARE Service Center (TSC) instead performs this function. The CAO is responsible for ensuring that the beneficiary is connected with the TSC.

Hours of operation are 0700–2000 Monday through Friday (Tier 1) and 24 hours a day, seven days a week (Tier 2). The Center operates on a tiered system: Tier 1 is an ACD that allows the patient to select from #1 TRICARE Service Center, #2 Healthcare Information Line (HCIL), #3 Family Practice appointments, and #4 cancellations, consults and other information. All calls are routed to a live voice. Should triage be necessary, calls are routed to Tier 2 – nurse triage. The office is staffed with three nurses. After hours services include #1 cancellations, #2 HCIL, #3 nurse triage. Nurse triage is available 24 hours a day. Nurses triage from computer driven algorithms which reduces call processing time and improves appointment center efficiency.

In order for the CAO to meet access standard, all clinics must have a 30-day window of appointments available at all times. Template management and maintenance occurs at the clinic level. Appointments are not standardized (over 1400 appointment types), which adds complexity to the process.

The CAO is equipped with the state of the art telephone support and equipment, including telephone instruments and an easy to remember local telephone number as well as a toll free number for calls from outside the area. The telephone system provides Automatic Call Distribution, queuing, recorded

messages, management reports, voice mail, conference call capability, and day & night holiday modes. Using the system, the caller receives a menu of items that allows for screening of the telephone call and routing as appropriate.

Another call center feature of the CAO is *SmartTalk,* an automated routine patient/provider communication solution. This patient communication system uses staff voices to deliver professional and caring messages to patients. Utilizing ad hoc CHCS reports, the system delivers appointment reminders, reschedule notifications, provides patient education, conducts patient opinion surveys, and delivers alert messages for upcoming health observances. The system produces Summary Call Reports of patient call status. It then sorts them by provider, location or patient by printing them automatically via printing schedules for multiple office reporting.

Initial costs were approximately $50,000, with annual service contract costs of $8,000. The Central Appointment Office reports a 5–10% decrease in no-shows since implementation.

The CAO ensures staffing of personnel to accommodate a performance goal for average call processing time (to include queue, on-line, and wrap-up time) not to exceed ten minutes. The abandoned call rate for the service should not exceed ten percent between 7:00 and 8:00 a.m. and does not exceed five percent at all other times. Call management reports are evaluated by the Managed Care Department to adjust, as required, the staffing levels of the CAO.

# Chapter 4

# DISCUSSION

The following discussion is based upon an extensive literature review, benchmarking, process analysis, study findings, and consultation with technical experts.

## Idealized Design

Idealized redesign is a way that an organization's stakeholders prepare a vision of what they want their organization to be right now, assuming that it could be whatever they wanted (Ackoff, 1984). Once such a design is completed, planning should be directed at closing the gaps between what the system actually is and the idealized design (Ackoff, 1984). The constrained idealized design must be technologically feasible; operationally viable, and subject to continuous improvement (Ackoff, 1984). In every idealized design, there is an interrelationship between continuous improvement and redesign (Dr. Ken Brodeur, personal communication, March 20, 2000).

### *Appointment System*

The optimal patient telephone appointment system for Naval Medical Center's high volume Primary Care sites requires a centralization of Internal Medicine, Primary Care, and

Pediatrics as there is a common patient base with like products and services. Consideration should be given to centralizing the remaining Primary Care sites and Military Health clinics at the Medical Center. The higher the degree of centralization, the greater the degree of personnel proficiency, as well as optimal space utilization. This is due to the economies of scale and the application of queuing theory to telephone call demand.

Specialty care clinics should remain decentralized due to the broad variation in patient populations and in treatment plans. Centralization of the specialty clinics would increase complexity to the current process. Research indicates that productivity decreases as complexity increases in an Appointment Center.

Recent history within the MHS reveals that centralization of the entire appointment system may not be optimal and can reduce customer satisfaction (Funk, 2000). In TRICARE Region 2, Anthem Alliance, who manages the TRICARE contract in North Carolina and most of Virginia, plans to have 95% of the appointments made locally instead of the current centralized TRICARE Call Center due to numerous complaints before the House Armed Services subcommittee (Funk, 2000). Complaints included being “shuffled around on a Toll-free TRICARE phone lines,” and given incorrect information. There were complaints that junior service members resorted to asking their superiors to intercede so they could get an appointment for a family member (Funk, 2000). Sailors complained of waiting one to two weeks to see a doctor for a sore throat (Funk, 2000). Family members alleged

access to a doctor was deferred for three months because no appointments were available. There were also complaints of an unresponsive system in which telephone calls go unanswered (Funk, 2000).

An organization must understand its current processes and resources prior to implementing change. The healthcare organization must define its requirements which include: flowcharting the process, the appropriate use of technology, the proper staffing mix, training, and optimizing logistics.

*Technology*

Telecommunication system features and costs were obtained through consulting services with Lucent Technologies, Government Solutions.

The Naval Computer and Telecommunications Station (NCTS) controls communications within the Southwest region. The Naval Medical Center (NMC) San Diego is part of this region. The Naval Computer and Telecommunications Station has set up a consolidated area telephone system (CATS) which encompasses 14 major facilities and uses a five digit means of communication. Each location is connected via an Asynchronous Transfer Mode (ATM) Metropolitan Area Network (MAN) – which enables voice, video, and data transmissions. The connection from the MAN to the Naval Medical Center is an OC3 (Optical Carrier Level 3) at 155 megabits per second.

The Naval Medical Center currently uses a Lucent Technologies DEFINITY G2.2 switch, employing hardware developed in 1984 and installed in 1987. The software that runs the system was developed in 1992 and installed in 1995. The DEFINITY G2.2 is a discontinued product and will be unsupported as of the year 2001. It would cost approximately $1.5 - $2 million to upgrade the current system. According to Mr. Salmeron, Lucent Technologies Senior Marketing Representative, talks regarding system upgrade are underway among Naval Computer and Telecommunications Station (NCTS), Space and Warfare Systems Command (SPAWAR), Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC), Naval Computer and Telecommunications Area Master Station Atlantic (NCTAMS LANT), and NCTS Washington, D.C.

In addition to Lucent Technologies' attempt to upgrade the structure, the Department of the Navy (DON) is pursuing a Navy Marine Corps Internet (NMCI) initiative. The initiative stems from recognition that the Department of the Navy is now operating more than a hundred different data and communications networks. Managing the network capabilities under a single commercial service provider can yield great economies of scale, improvements in compatibility, and more effective and efficient communication and data exchange (Danzig, 2000).

The DEFINITY G2.2 can handle 25,000 stations and 4,000 trunks. The DEFINITY G2.2, although discontinued and unsupported, does have some call center features. Call vectoring is a simple programming feature which allows a manager

to vector calls within the hospital based upon six criteria: time of day, day of week, number of callers in queue, longest time in queue, number of agents logged in, and number of agents available. Vectoring is often a feature used by a call center manager to put the call center in autopilot. For example, at six in the evening when the department closes, calls can automatically be redirected to a predetermined destination, instead of the caller getting a recording announcing department hours. Call vectoring is available as a feature; however, the expertise is not available for programming.

The DEFINITY G2.2 has an Automatic Call Distributor (ACD), a feature that allows for the distribution of incoming calls to the most idle agent. In addition to an ACD, there are two other features, which do not use a matrix to automatically distribute calls to the most idle agent. The first is Direct Department Calling, which routes calls to a group of resources in a predetermined order. Therefore, the first of these resources will always be the busiest, and the last resource will be the most idle. The second feature is a Circular Hunt Group, which routes calls in a predetermined order--always starting where the last call was sent. For example, if there are eight agents and the last call went to agent number two, the next call would be routed to agent number three. If agent number three were busy, the call would then go to agent number four.

The Naval Medical Center utilizes a Call Management System (CMS), which connects to the processor and collects real-time and historical information. This information is sent to a

desktop computer via an Ethernet port. The CMS is sized by users and by hard drive disk space. Currently, the CMS at the Naval Medical Center is not being utilized to its full potential. It would cost approximately two thousand dollars per day for a call center specialist to set up and program customized reports and tune-up the current appointment center. Typically, a tune-up requires one to two weeks. With the tune-up, the Naval Medical Center can have access to color coded screens, pop up screen reports, features that will allow the individual managers to customize the information to meet their specific requirements. For example, calls waiting greater than three minutes will flash red on the computer screen to alert the manager across the room to immediately take action. Also, all high volume clinics could be monitored simultaneously from one screen monitor.

The CMS also has the ability to capture information related to all call handling parameters from trunks to agents. Based upon the number dialed by the user, the G2.2 recognizes the group for which calls are intended (queue). The CMS can also verify calls dropped by queue.

The Naval Medical Center uses an INTUITY voicemail system to provide auto-attendant functionality. It has been upgraded to a 1999 version of software and hardware. Because an auto-attendant feature is not resident on the G2.2 switch, the auto-attendant functionality is provided by the INTUITY. Therefore, the caller is not in queue when making selections--thus prolonging wait time. Also, the Call Management System would not capture these calls until the selection is executed.

Putting the tools at the agents' desktop can optimize their efficiency. For example, an ergonomically designed Lucent Call Master IV phone would allow agents to simply push a button for break, for training, for log in, as well as to display the longest call waiting and the number of calls waiting in queue. This can empower the agents to make more informed decisions. This phone currently costs approximately $600.

The DEFINITY G2.2 is Primary Rate Interface (PRI) compatible. The G2.2 switch accepts Automatic Number Information (ANI)/caller ID information; however, it cannot route calls based upon this information.

Many state of the art features are not available to the Naval Medical Center on the G2.2 switch. Lucent Technologies Flagship product is the DEFINITY® Enterprise Communications Server (ECS), also known as a G3 switch. The DEFINITY® (ECS) can support 25,000 users, utilizing technologies such as Asynchronous Transfer Mode (ATM), Voice over Internet Protocol (VoIP), and Internet Telephony. The DEFINITY® ECS allows an enterprise to move to a "converged" network without any compromise in applications or reliability (Lucent Technologies, 2000).

Most DEFINITY Call Centers also incorporate another system known as the CentreVu conversant. The conversant system is an adjunct processor that connects to the DEFINITY® ECS to provide access to a myriad of programs that can be invoked to direct call handling on the DEFINITY and provide for computer telephony interface (CTI).

By utilizing the conversant and the DEFINITY® ECS, the Naval Medical Center can take advantage of the feature known as expected wait time. Expected wait time is a conversant feature that uses parameters to provide a wait time to the caller. Conversant is a multiple application programmable system that integrates the caller to the organization’s database and makes information available to the caller in an automated fashion.

Typically, a conversant feature is used to automate the call handling process. The financial impact is that through this hardware, the appointment center can expand the number of agents. Conversant shines with commercial off the shelf (COTS) products; however, because of the proprietary nature of CHCS, development costs may be higher than normal. The cost for a low-end typical conversant may be $50,000 and $1.5 million for a high- end model. Initial investment to introduce this feature to the Naval Medical Center would be between $100,000 and $200,000. This feature is sized by ports and hard drive, and programming software.

The DEFINITY® ECS (G3 switch) has Voice over Internet Protocol (VoIP) capability; whereby, the call agent’s computer is a phone. The G3 switch can also handle queues from multiple sources (INTUITY, intranet, email, internet, faxes etc.) by combining the different servers on the LAN. The G2.2 switch does not have LAN capabilities and cannot be connected to those services. The G3 switch can be connected to the LAN; therefore, it is simple a matter of programming those services to integrate the different servers to make it transparent to the end users.

The DEFINITY® ECS is a state of the art platform with ATM, LAN, Ethernet, and CTI access. Many features on the G3 switch are not available on the G2.2 switch. The most important of these include: best service routing; look ahead overflow (create one big hunt group-look ahead to all other appointment centers or ACDs); best routing (don't just look ahead, but continuously monitor to where the call will best be handled between appointment centers); and expert agent (skills based routing).

The optimal patient telephone appointment system for Naval Medical Center's high volume Primary Care sites requires an upgrade of the current telephone switch to the DEFINITY® ECS (G3 switch) with added features. Such features include, but are not limited to, the Call Management System, Automatic Call Distributor, INTUITY, and CentreVu conversant. The Naval Medical Center should pursue funding from NCTS, as the current switch will be unsupported as of the year 2001 (Mr.Luis Salmeron, personal communication, March 14, 2000).

A Call Center can help an organization meet its mission and vision. Call Centers can play a central role in acquiring new customers and retaining existing customers (Lucent Technologies, 2000). It is for these reasons that the healthcare industry has adopted Call Centers for traditional applications such as claims processing and treatment authorizations. Now call centers are being used in new applications such as nurse triage and centralized scheduling. Nonetheless, call centers are not competitive tools unless they can increase customer satisfaction.

Ideally, one telephone number should function as the beneficiaries' point of access for appointing and referring needs. A central access number (with brand equity) should be provided such that when a patient calls, he will have a minimum of four options: a triage healthcare professional, Health Care Information Line, an appointment clerk, and a message center for patients to communicate with their PCM (Department of Defense, 1999). Transferring calls off base or to another 800 number (such as HCIL) is possible on the G2.2 switch; however, it may be discouraged by the Naval Computer and Telecommunications Station due to toll fraud issues. Consideration must also be given to web-based applications such as appointment making and communicating with patients. Only after requirements have been identified in terms of technology, logistics, processes, staffing and training should consideration be given to moving toward a one-stop shopping, Call Center concept.

*Staffing to Support Technology*

An "idealized" system requires upgrading the Telecommunications Department; otherwise, the telephone appointment system will remain a lower priority for the Information Resource Management Department (IRMD). This is a telecommunications feature typically handled by a Telecommunications Department. In the age of convergence, down time of ten minutes in an Appointment Center can have dramatic consequences. This technology changes daily. Most of this technology is software driven; therefore, the hospital needs

professionals who are dedicated to this endeavor. This group must be empowered to effect change in the business processes for the hospital. Telecommunications can be considered one of the most important aspects in patient satisfaction; and as such, care must be given to the establishment of this department to better serve the patients.

The Telecommunications Department at the Naval Medical Center must be able to support the G3 switch and its other features to include the CMS, ACD, and INTUITY. The Department should constantly interface with the end users, seeking ways to continue to enhance integration of technology into systems performance. There must be frequent and ongoing interface with NCTS and Command vendors regarding new technology and the integration of this technology into systems performance. The Telecommunications Department must be capable of conducting ongoing training and updates on the telecommunication systems.

*Appointment Center Staffing*

There must be flexible staffing based upon workload analysis. In other words, deploy staff to meet demand. Staffing should not be considered fixed. Primary staffing requires experienced telephone service representatives. Physician oversight is required if triage is a feature of the Appointment Center according to the American Academy of Ambulatory Nursing (AAACN). Triage nurses must be dedicated and highly skilled. The Appointment Center manager must be dedicated and have call center experience.

*Training*

The optimal appointment system requires training in general systems knowledge to include: health plan information, location of services, volume statistics, and workload flow. In addition, training should consist of two weeks of systems orientation to include: appointment templates, CHCS, appointment making process, logistics, and the telecommunication system. Agents must have a solid understanding of appointment types and guidelines. This includes an understanding of when to book an appointment as an acute, routine, or refer to triage.

Throughout the training, there must be an increased emphasis on customer service and telephone etiquette. Agents should receive an additional two weeks of training receiving live calls. This requires a one-on-one training; whereby, an experienced agent actively monitors the trainee’s calls to provide intervention when necessary. Training must focus on performance measures.

Competency tests should be administered throughout the training. The Appointment Center Manager must receive additional training in problem resolution at the general systems level. All personnel should receive refresher training monthly, with a minimum of 40 hours annually.

*Logistics*

The Command Safety Department should be consulted in the design. Safety should be the Hospital’s first priority. The Appointment Center must comply with the Americans with

Disabilities Act. Workstations can facilitate team building or discourage it. Hence, the workstation required for the telephone appointment center is the cluster--or pinwheel like setup. This floor plan allows for people to walk through the Appointment Center and between groups, fostering teamwork (Dawson, 1999). The workstation must be ergonomically designed and consist of 30–45 square feet per agent. Desks should be adjustable so that agents have the option to stand while working. Foot rests, wrist pads, and ergonomic chairs are just a few of the required items in an ergonomically designed work center.

*Process Improvement*

Appointment types for the Primary Care clinics should be standardized as this leads to decreased call handling time and increased efficiency of the Appointment Center. The PCMs should operate on a rolling schedule; whereby, templates are available five weeks out at any given time. The goal is to maintain a constant availability of appointments rather than have the tidal wave pattern, in which appointment availability significantly diminishes prior to receipt of the following month’s schedule. Releasing appointments monthly exacerbates telephone queuing problems, poor appointment booking staff performance, and customer dissatisfaction. It is recommended that there be an 8-week appointment availability for follow-ups. Each clinic should provide a point of contact for scheduling. At present, it is recommended that schedule creation and template management remain at the clinic level. As more clinics are centralized,

this could be a function of the Appointment Center--for better management and economies of scale.

It is recommended that brand equity be built into an 800 toll number (i.e. 1-800-TO-BALBOA). This telephone number should function as the beneficiaries' point of access for appointment and referring needs. In particular, this central access number should provide five options: a triage healthcare professional, the Health Care Information Line, an appointment clerk, a message center for patients wishing to communicate with the provider, and a cancellation line. There should also be a dedicated line for internal customers.

It is suggested that all calls be routed to a live voice. Avoid situations where one ACD routes to another ACD. The Appointment Center could reduce hang-ups by 50–80% by utilizing on-hold messaging (Dawson, 1999). On-hold messaging can provide image enhancement as well as answer frequently asked questions. On-hold messaging can also provide wellness information and promote health education classes at the Naval Medical Center. The Call Vectoring feature should be utilized with the ACD; whereby, calls are automatically routed according to pre-set conditions. Call Prompting feature is a benefit also. This feature allows the callers to select options from a menu to self-route their calls.

It is recommended that the telephone service representatives utilize established Standard Operating Procedure Manuals and algorithms. Nurse triage should be accomplished from clinically tested and computer driven algorithms, which reduces

call process time and improves Appointment Center efficiency. This can prove to be very cost effective, as acute appointment demand can be reduced by as much as 30% in the PCMs (Kentch, 1996). For patients who require triage, it is recommended that the TSR send a message to the clinic's nurse via CHCS, which would print directly to the computer at the nurse's workstation. The nurse would be required to call the patient back within two hours. This would eliminate the bottle-neck on the phone lines to the triage nurses. A template should be designed to facilitate this process, annotating the required information needed on the message. The patient should also be informed of the process i.e., that a message will be sent to the triage nurse who will respond within two hours. It is recommended that the Hospital establish message guidelines for physicians i.e. Physicians will call the patient back within 48 hours.

Hours of operation for the Appointment Center should be extended beyond the current hours offered by the Primary Care clinics. For customers who prefer face-to-face contact, they should have the option of booking in person at their enrolled Primary Care clinic. This is the most logical booking method for patients who are require a follow-up appointment while at their PCM. Consideration should be given to placing a terminal and trained clerk in a central location to book appointments for

those patients who prefer face-to-face contact. To facilitate booking, the CHCS Managed Care Program Module and the TRICARE Prime CHCS Electronic Consult Tracking System should be utilized.

The cancellation line should be available 24 hours a day; whereby, the caller may leave a message on voicemail after hours.

*Systems Performance*

Identify those operational data for which performance data is needed. Develop best practices from those suggested. Then establish benchmarks for each dimension identified.

It is suggested that performance measures should include:

- Service Orientation: greeted customer, maintained composure, expressed commitment to customer satisfaction, professionalism, used customer name
- Communication: animated tone, expressed confidence, enunciated, used familiar terms
- Addressing the Issue: asked clarifying questions, listened actively
- Call Management: controlled the call, minimized hold time
- Closing the call: recapped the call, offered additional assistance (AT&T Wireless).

It is recommended that customer satisfaction surveys be conducted within 24–48 hours of patients' utilization of the appointment system.

Call Management features should be utilized to measure agent productivity and efficiency i.e. call handling time, call waiting time. It is suggested that Average Call Wait be no longer than 60 seconds. It is suggested that three minutes be the benchmark for talk time. The longer the talk time, the lower the productivity of the personnel. Performance below 55 calls/day/agent should be called into question as not being efficient.

# Chapter 5

## CONCLUSION AND RECOMMENDATION

It is recommended that the process redesign as presented in the discussion be implemented. The Strategic Planning Board for Goal 1 must educate providers on the options available and solicit their feedback. The providers' input must be factored in to the ultimate design.

Consideration should be given to centralizing appointments for all of the Naval Medical Center's military health clinics through a phased-in approach. This would include the active duty population served at the branch clinics.

No one size fits all to scheduling as every facility setup is different. Therefore, careful attention must be given to understanding the current processes and resources. What is the level of efficiency of the current system? What are the appointment types, volume of calls, requirements of the telephone service representatives?

Customer requirements must be identified. How satisfied are the customers? Is the healthcare organization losing market share due to system inefficiency? The well-managed healthcare organization must focus on the needs of the customer as customer loyalty is critical to success. Effective partnering with the patient leads to a healthier population and supports Military Health System optimization (Surgeon General of the United States Navy, communication, February 1, 2000). The connection between

patient and employee satisfaction cannot be overlooked. Research suggests that indicates that employees who feel their efforts are appreciated will be more likely to provide excellent patient service.

Good systems must be in place to provide efficient use of limited resources. Requirements must be identified in terms of technology, logistics, processes, staffing, and training. Consideration must be given to web-based applications such as appointment making and communicating with patients. The healthcare system must be user friendly and accessible. We must adopt the tools of the twenty-first century.

Basic customer service skills and process improvement training should be given to all staff on a recurring basis. Training should be focused on sharpening such skills as listening, problem solving, and process improvement. Success requires that management support the training efforts by providing the resources and creating the optimal conditions for the application of newly learned skills to the job.

Information must be shared across the departments. Clinicians, administrators, and the telephone service representatives must be kept informed of how the appointment center is doing (problems, challenges, what improvement efforts are underway). Leadership interaction with employees helps to ensure an effective communication process.

Empower the staff to make decisions and act on behalf of the customer, consistent with their training and expertise, in order to do what is essential to promote customer satisfaction.

The best organizations are those who entrust and energize the staff to satisfy and exceed their customers' expectations. Data must continue to be collected on both internal and external customers and used to promote performance improvement.

The ideal healthcare organization of the future must create a learning environment that will foster innovation and teamwork. This will entail system redesign as well as implementation of best practices.

The competitive healthcare environment requires a much better understanding of customers' needs and requirements (including internal customers), the hospital's capability, and how the hospital plans to change. Thus, the hospital must combine the right technological tools with sound business practices, which must be built on key operational data.

Improved and timely access enhances military readiness. More importantly, it demonstrates that we are committed to our customers' healthcare needs.

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# APPENDICES